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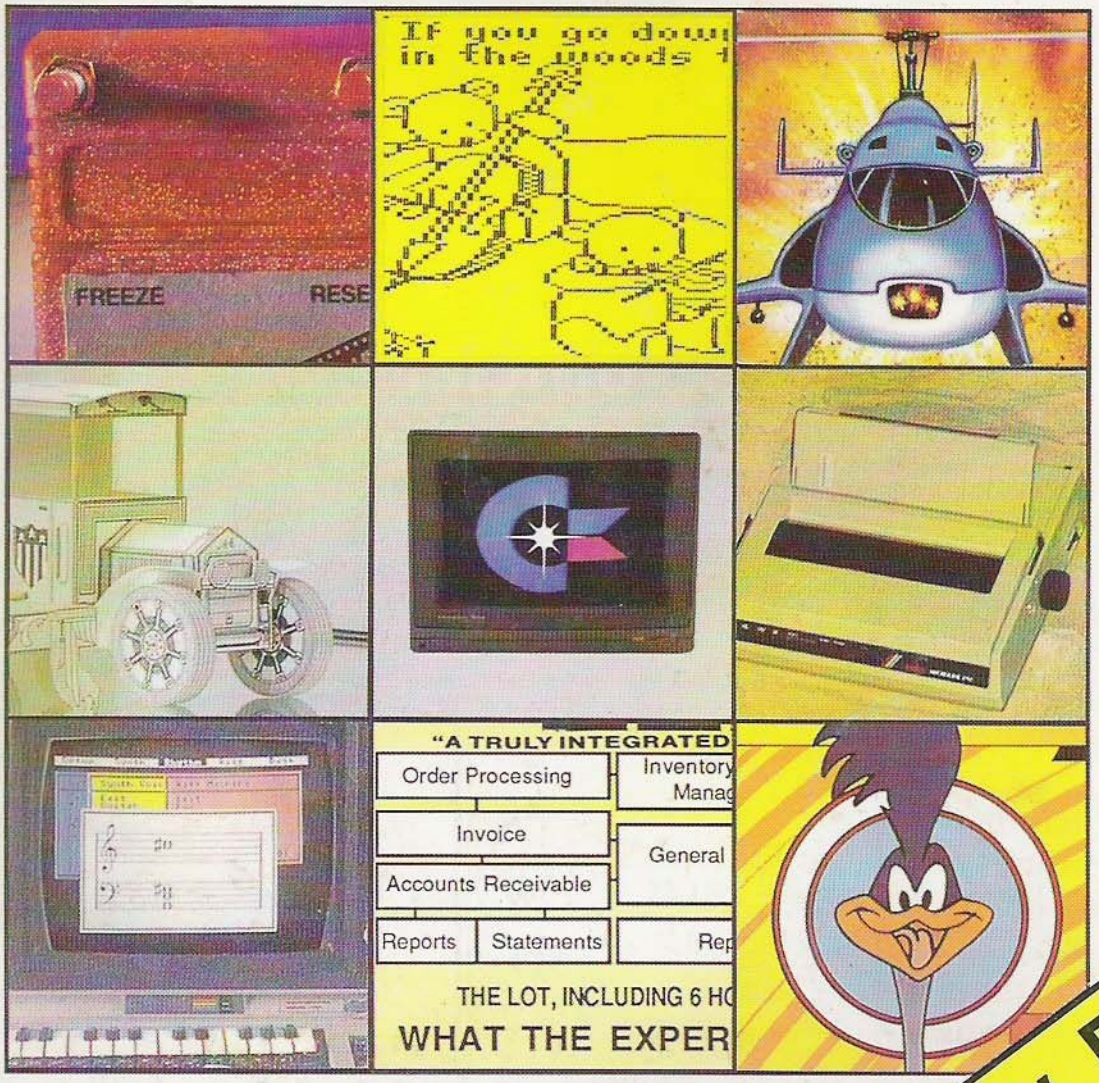

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Full Family Pack start-up instructions

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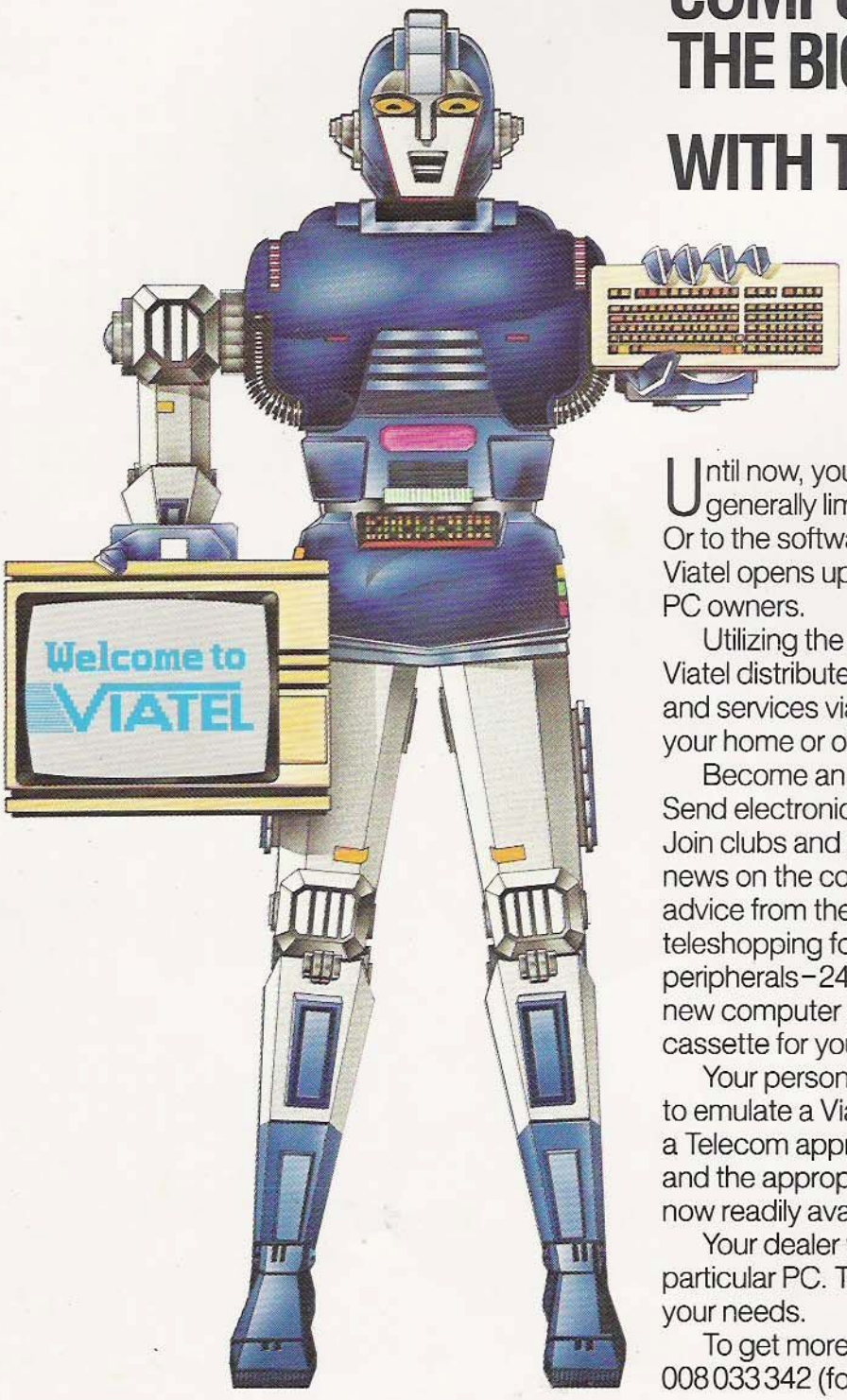

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The Australian COMMODORE REVIEW ANNUAL 1988

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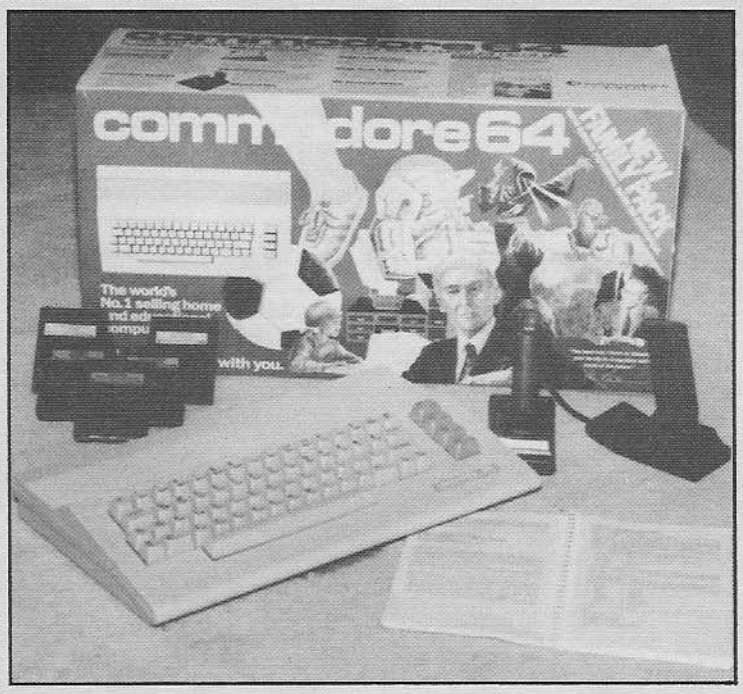
Get the most out of your new Family Pack

Congratulations!
You've just purchased the world's most popular home computer. Over seven million Commodore 64s have been sold since the machine was released in 1982.

A huge range of programs are available, and many new packages are released each week. To keep you up-to-date, and provide invaluable hints on getting the most out of your computer, visit your local newsagent and ask for the *Australian Commodore Review*.

You've probably already unpacked your computer, and plugged it in. If not, check our guide to setting-up at the end of this article.



Now, what can you do with your new machine? Several programs are included in the Family Pack. These are stored on cartridge. A special

For a more professional entry level into computing, Pro Pack comes complete with Commodore 64, disk drive, and GEOS. (And joystick, of course).

silicon chip inside permanently stores the program to be executed by the computer.

To use them, switch off the Commodore 64. Locate the expansion slot at the left hand rear of the computer.

With the label facing up, slide the cartridge firmly in. Now switch the computer back on. If all is well, a display should appear in about three seconds. Otherwise, switch the computer off, and check the cartridge is properly seated. If all else fails, contact the dealer you purchased the computer from and he will advise you further.

Now you are ready to start.

We've included a brief review and guide to using four of the five cartridges included in the Family Pack, *Financial Adviser, Magic Desk, International Soccer, Visible Solar System.*

But first, let's take a look at the keyboard. Notice it is much the same as a standard typewriter. There are a few extra keys that perform special functions.

One of these is the RETURN key. It tells the computer that you have finished typing. In *Magic Desk*, using the typewriter function, the RETURN key works in much the same way as a Carriage Return Lever on a typewriter.

Just below the return key are the cursor keys. The cursor is the flashing square you see on the screen when you first switch on. It marks where the next character will be printed that you type.

Just to the right of these are the function keys. Although there are only four keys they produce eight different functions, depending on what program you are using. *International Soccer* uses these to choose player colours, at difficulty levels.

On the right hand side of the computer just in front of the on/off switch are the two joystick ports. Joyport two is located toward the back of the machine, and is the one most often used by games programs.

Your monitor or television picture will have a border around it. This is designed to allow for the additional distortion which occurs toward the edge of the screen. It allows graphics to move smoothly off and on the display.

Software can also be stored on disk or tape. You will probably purchase a disk drive at some later date. This will give you access to a vast number of additional programs, including GEOS. A datasette, which uses ordinary cassette tapes, is less expensive to purchase, but operates at far slower speeds.

Some programs, such as *Magic Desk*, work best with some form of additional storage mechanism. To take advantage of the GEOS offer included in the Family Pack, you will need to buy a disk drive. Take a look at our guide in this publication.

Hundreds of other special add-ons are available. You can connect a printer to make a hard copy of your work, be it text or graphics. Or plug in a modem and talk to thousands of other users using Australia's growing Bulletin Board Network. It's all explained inside our *Commodore Annual*. So get reading!

Start up - Commodore Family Pack

Here's a guide to overcome common glitches in setting up your new Commodore 64. We haven't covered what the users manual already states. However, there are some obvious points left uncovered.

Connecting the power supply is reasonably simple. Do that, as described on page three of the user manual. Locate the long dark cable, with a plug on each end. This is the video cable.

It is similar to the cable used between a VCR and your TV aerial socket. One end has a long prong sticking out of the middle of the socket. Plug this end into your computer.

You'll find the correct connection, looking from the front of the keyboard, slightly to the right of centre.

The other end should plug directly into you TV, normally on the top left hand side, looking from the back. If there doesn't appear to be a socket, but there are two screw terminals, you will need a small adaptor.

It will cost less than two dollars, and is called a 300 - 75 Ohm adaptor. Tandy Electronics and Dick Smith stores normally have a good supply.

Now it's all connected, you can switch it on. But first turn your TV tuner to UHF, and adjust the dial for channel 36. Switch on your computer, and fine tune the display. Sometimes you will find you get sound first, before the picture appears. Adjust the brightness and colour controls for the best results once you've got a steady picture.

Plugging in a Cartridge

Switch off the computer. Locate the cartridge socket. Looking from the front of the keyboard, it's on the far right hand side rear. Insert the cartridge firmly, with the writing facing up. Sometime you may need to wiggle it slightly. Be sure to press it firmly home, the fit is normally fairly tight.

Now switch on your computer. After two or three seconds, the display will reappear. If not, switch off, and check the cartridge is properly seated.

Where to put it

If you plan on using a disk drive, or datasette, be sure to position your computer away from the TV, and in a well ventilated area. Cassettes and disks are especially susceptible to magnetic interference. Don't put your disk drive or cassette player too close to the TV.

If you're using a small desk, with enclosed spaces, heating problems may occur. If your disk drive, or computer starts acting up, give it time to cool down, then try again. If the problem remains, contact a ComCare office near you.

What is Basic

Having switched on your new Commodore 64, a special message will appear at the top of the screen, "**** Commodore 64 Basic V2 ****". Beneath it another line of information displays the amount of available Random Access Memory. Normally this is 38911 bytes. RAM is like a scratch pad, or work space within which BASIC may work.

BASIC is the language you can program your computer in. Your Commodore 64 actually speaks 6510 assembly machine code. However, this is very difficult for us humans to understand. So, we use an interpreter called BASIC, or Beginners All Purpose Symbolic Instruction Code.

It's a handy language that's not for any special purpose. It can handle complicated mathematics, or move around and display lists of names and addresses. You can even write your own games!

Each instruction resembles English, so it is fairly easy to learn. For example PRINT is used to display information on the screen. INPUT allows you to enter data into the computer. These commands are placed on lines which are numbered.

BASIC interprets each line in numeric order. Since these commands must in fact be converted to machine language, the process can get a little slow on complex tasks. Most programs you buy in a computer shop are written in machine language which is much faster.

However, BASIC is fine for learning about programming and for writing a lot of fun little applications of your own.

Whenever you type in a BASIC command, be it to LOAD a program or enter a particular line of a program, nothing happens until you press return. Try pressing this key a few times. You'll notice the cursor moves down the screen one line with each press.

Don't be afraid of typing the wrong thing from the keyboard. Nothing you can enter will damage the computer. Just experiment a little, and you'll find that BASIC can be a lot of fun.

The user manual included with the Commodore 64 explains how to use the keyboard. It also provides a brief tutorial to using many commands. If you find these a little hard going, a regular series in the *Australian Commodore Review* called "Basic is Easy", provides step by step instructions to writing your own programs.

A few tips on entering your own programs

* SAVE to disk or tape every fifteen minutes. If anything unexpected should happen, such as a loss of power, you won't lose too much work.

* SAVE to disk or tape before you run the program. Some examples contain special commands which directly alter the computer memory. (PEEK & POKE). If you have made a typing mistake, these may change the wrong location causing the computer to "Crash". You may have to switch off and on to get going again!

* If you get stuck in a PRINT statement trying to enter colour controls or graphics symbols, press SHIFT-RETURN. Move back to where you wanted to enter special symbols. Now press insert for as many symbols as you need to enter, and re-type them. Delete any unwanted symbols.

* Be careful! If you LOAD a disk directory using the LOAD"$",8 command, you'll lose your program in memory. Format a disk to SAVE to before you start. Check it has formatted correctly by LOADing the directory.

* Shift run-stop tries to LOAD from tape. If you see the words - SEARCHING FOR... accidentally, just hit RUN-STOP and RESTORE at the same time. This is called a warm start. Your program will still be intact.

* If you press return on the READY word, you'll see the message OUT OF DATA error. This is because BASIC has tried to execute a READY command. Since there are no variables to read in direct mode, you get the error message.

* Be careful! The number zero and the letter O are not interchangeable. Be sure you have the right one entered. Also be careful with commas (,), colons(:) and semi-colons(;). The two commas around file names when loading from disk or tape are called inverted commas. (").

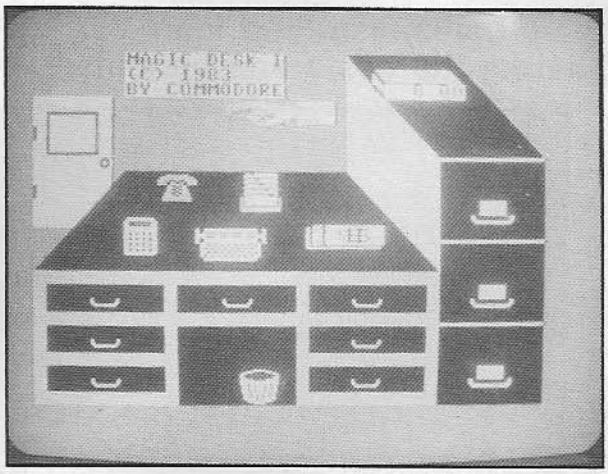
Glossary

Abort: Panic! Stop an operation during mid flight. Abort a file transfer would mean prematurely stopping the process.
BASIC: Beginners All Purpose Symbolic Instruction Code. A language used for programming home computers, similar in some areas to English.
Characters: The letters, numbers, punctuation and other special symbols produced by a computer.
Cursor: Square or line, usually flashing, which marks the position that the next character will be printed at.
Disk: A round flat platter for storing information on magnetically.
Expansion: The ability to add additional hardware to the computer, such as memory (RAM).
Joystick: Controller for games, drawing and graphics programs which has five switches. (Sometime more). Up to nine directions may be read.
Keyboard: What you type on.
LIST: Display a program in BASIC. Also lists a disk directory after the LOAD"$",8 command.
LOAD: Transfer a program from a storage device such as tape or disk, to the computer.
Monitor: Screen or display for viewing the computers output. A monitor is usually of higher quality than a normal colour television.
Port: A socket or connection for adding a peripheral such as a joystick. There are two joystick ports on the right hand side of the computer.
Return: Also known as enter. Pressing this key tells the computer you have finished typing.
Screen: See monitor.
Syntax: The grammatical arrangement that the computer understands. A syntax error means you've made a typing mistake or entered something the computer doesn't understand at all.

Magic Desk

They say that a tidy desk is the sign of insanity.

But if once and for all you'd like to clear the papers and the white-out paint from off the ink blotter and have it all come together in one totally neat little envelope then take a smart look at *Magic Desk 1 Type and File System* which comes with the Family Pack. Even when you come to the stacks of disks scattered and piled across your desk, this baby seals the productivity doors and gets you nicely organized into doing some serious work.



Here you don't have to memorise a long list of commands and instructions because it is all pictures, an illustrated guide to efficiency.

Magic Disk 1 activates four key items on screen - Typewriter, File Cabinet, Digital Clock and Wastebasket. You can use these items to type and file personal letters, memos, reports, lists, students' papers and more. And, obviously, with the initial release from Commodore of its *Magic Desk* being entitled 1 it's great to anticipate that future cartridges will introduce such handy instruments as the calculator and financial journal among others. (*Although that is unlikely, it's kind of nice to dream - Ed.*)

It comes equipped with a digital clock, which is easily activated along with the rest of the icons by moving a simulated finger around the screen and pointing to the particular picture.

The Wastebasket is the erasure mode. You use it when deleting material from the typewriter or earlier file. This is a permanent measure. Once utilized, it's irrevocable. Proceed with caution.

To erase a page move the pointing finger to the wastebasket and press what the people at Commodore call the "action button" as opposed to the colloquial term "fire." The paper that is about to be wiped out then hovers over the wastebasket giving you a "second chance". Then, hitting the fire button does the damage for you.

The Magic Desk Typewriter

Fully animated and working just like a real honest to goodness writing tool from those ancient days of the seventies. An on screen version using the obviously exact same keys as the computer keyboard.

To activate you move the pointing finger to the typewriter and hit the fire button. The typewriter screen appears with a white box around the typewriter at the bottom of the screen. Let the dictation begin. Tab settings, margin shifts, function tabs are all there and easily learned.

The Magic Desk Printer

The great thing about *Magic Desk*, is that it provides an easily accessible word processing system without the newfangled rigmarole that does not contribute to the greatest of user friendliness. Now, after a page is set you point the finger to the printer icon and press the action button. And you've got - action.

The Magic Desk File Cabinet

This is automatically connected to your disk drive provided of course you've plugged it in. Five easy steps to filing.

1) Type a page and leave it in the typewriter,
2) open a file drawer,
3) open a file folder,
4) choose a page location and
5) save the page on disk.

The file cabinet contains 3 separate File Drawers with 10 file folders in each drawer and 10 page locations in each folder. One floppy diskette can store approximately 30 pages of text. It's probably best that you use different diskettes for different subject areas or file topics.

Additionally there are other simple steps to easily labelling files, opening and choosing files and viewing and saving pages.

In summary, the *Magic Desk Type and File* program is the gem of the Commodore Family Package. It's smart, it's easy, it's for every person of the family for creating neat, clear editorials for both yourself and others as well as providing a sound beginning to the limitless bounds of word processing.

Financial Adviser

The manual starts by revealing its intent to help the user make "complex financial decisions." Immediate response to this is "Great, I need that kind of help. Thank you very much." But when you start to analyse the reality of such a claim you suddenly get worried. "Complex financial decisions" are not the sort of thing you want to leave to the keyboard, not really.

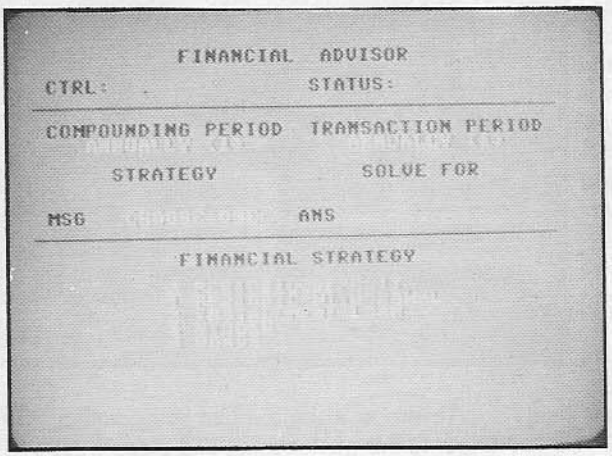
But as an advisory system, a helper in planning - the Commodore *Financial Adviser* system is beneficial. It provides you with fast solutions to any questions about loans and investments. It then lets you compare investment and loan opportunities by calculating the costs and benefits of five common financial arrangements including, Periodic Deposit Accounts, Periodic Withdrawals, Installment Loans, Stocks and Bonds.

In addition to quick answers to a variety of questions in each of these categories of financial strategies, the *Financial Adviser* also has a calculator mode. With it you can solve secondary calculations and then move the answers over for solutions to major questions of finance.

For an example of the way it works the manual equips us with a well presented step by step outline of each of the procedures. Basically, the beauty of the program comes from key commanded working modes that bring up the answers to the screen according to the simple formula of about three to four entries to obtain a particular value.

" Lets you compare investment and loan opportunities by calculating the costs and benefits."

For instance, taking out a loan, paying monthly installments over a twenty year period. The loan is for $70,000 and the annual interest is 13.5 per cent. All you have to do is tell the *Financial Adviser* what kind of problem you want solved (amount of payments for a loan) and fill in the details of the loan (amount of loan, number of years for the loan, and the annual interest). The program does the rest.



On screen the next display is headed with the listing for financial strategy. Here you choose number 2 for installment loan. After that you key in the Control which enters onto the screen another heading entitled "Determine The..." and eight choices, 0 through 7 are listed. So in this instance, selection 0 is for payment amount and appears under the heading "SOLVE FOR.." So you must enter 70,000 next to LOAN AMOUNT, 20 next to number of years and 13.5 next to annual interest. In a matter of seconds you'll have the answer for the amount of annual payments and should be $10,265.58.

Next you type in TPMENU (Transaction Period Menu) and under these next listings select from the various terms, monthly. You enter your selection and in just moments you're figuring out how you're going to make the $806.69 payments.

Lastly, because mortgage loans are compounded monthly a CPMENU (Compounding Period Menu) is provided and running through the similar procedures as before finds you staring at an extra $39.00 for your trouble.

The program is efficient and swift. It provides a smooth, general insight into the world of finance and assumes for you a complete knowledge of basic rules relating to it. In particular, it acts as a practical guide to accustoming yourself to the money market and makes great practice for you. I feel this is the better side of it.

International Soccer

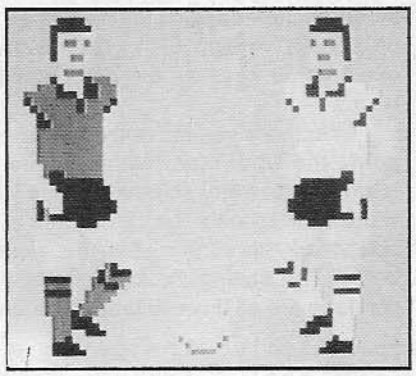
Had fun on this one. Lost miserably, but what the heck, huh?

So, after doing your work at your *Magic Desk*, then a little study into the *Visual Solar System*, the best thing to do, to clear all those finance cobwebs from your brain, is to get into a really hectic match of soccer. And with this Commodore package is quite challenging manifestation of the most popular game in the world.

Commodore's new *International Soccer* game is a very realistic version, and one of the best, if not, the best, on the 64.

Strategy and skill are as prominent in this game as ice is on a Dynasty set. Realism as intoxicatingly superb as the amber that bathes that ice in the field of glass.

The game begins, and playing against a humanoid on the other joystick I kick off. The ball gets taken down field, I'm covered by three guys. The right opposition player is starting to close in, he's really close now! I kick, and wham! My



fellow team mate has come in from the left, carries it down the middle, touches it back into the corner to yet another team mate and . . . no, no . . . the red team just sent in one of their guys from deep inside their end zone, he's got possession . . . he kicks, I get it again, immediately send it off to my own blue guy that's running beside me.

Faster, faster, faster, we're in the red zone now, he jumps off in front of two red guys at my right, their goalie is blinded momentarily, I take the kick! . . . SCORE! And the fans go wild. (*Mark plays this game in his sleep - **Ed.***)

Keep that up long enough and throughout the two halves and you'll have a pretty little prom queen or Miss Argentina - whoever, come on out and present the winning team with a trophy and the fans keep cheering. Soccer at its finest.

You get colour choice at the beginning and the opportunity as well to play against the computer. It's a lot more fun to have somebody else there to rant and rave alongside, though.

After selecting colours and opponent, pressing the fire button on the joystick top starts the game. (*In case your button isn't on the joystick top, any other nearby button will suffice - **Ed.***) The whistle blows to signal beginning of play and the running clock starts timing the first half.

There are two halves lasting 200 units of time each. The teams switch ends after the first half.

You directly control one player with your joystick at any given time. This

player changes to a lighter shade of the team colour so that he is easily recognized. In other words, a player on the red team changes to pink, etc. The player controlled by the joystick moves in the direction the joystick is pushed. Press the fire button to kick the ball. A player always kicks the ball in the direction he is facing.

The player that is under direct joystick control is based on ball possession. The offensive player with the ball or nearest the ball changes colour to be moved around by your joystick. The other players on the team run patterns in their appropriate zones related to the movement of the ball. The defensive player that changes colour is the one closest to the ball. The other defensive players play their zone or pursue the ball. Only a portion of the field may be seen at one time. The area of the field shown depends on the location of the ball. If a controlled player goes off the screen, a player on screen changes colour to be joystick controlled.

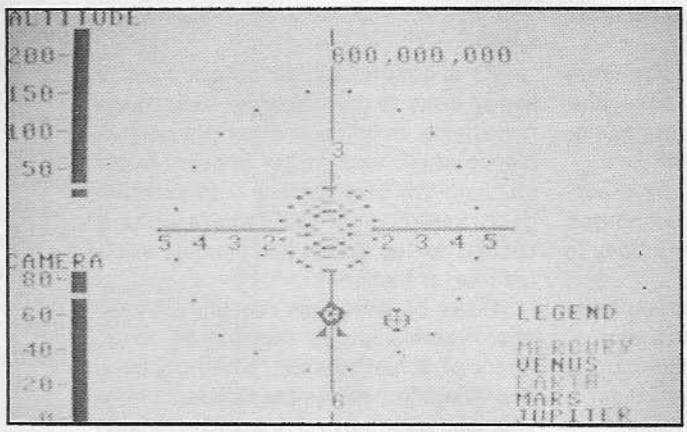
The goal keeper is controlled by pressing the fire button only, he automatically moves in the direction the ball is kicked. Press the fire button to get the goal keeper to attempt a save. If the ball goes out of play, a free kick, goal kick, or corner kick is awarded. Press the fire button to get the ball to be thrown or kicked back into play by the proper player. If the fire button is not pressed, the ball is brought back into play after a short interval.

And something I found out much to my disbelief is that if the score is tied at the end of the second half the contest ends in a tie.

It's exciting, fulfilling and fun. What more is there to say? What more could you want?

Visible Solar System

You become the commander of a spaceship on an incredible journey through the Solar System. The ship has a cruising range of over 1 billion miles and is packed with computerized equipment to help you bring home new and exciting discoveries.



Loaded onto your screen is a model of Mercury, Venus, Earth and Mars revolving around the sun. You will be able to visit other planets too for a close inspection of their features and motion.

And it all happens from the flight deck control panel - the Commodore keyboard. From here you monitor and change the position of your spaceship along the designated course of associated numbers showing the distance of the orbits of these planets in hundreds of millions of miles from the sun. The initial position of your spaceship is shown in red and on the top left of your screen you see the altitude of the ship in millions of miles above the orbit of the planet.

And to get you in fine visual tune your ship is loaded with a rotating camera showing you the orbits and movements of the planets in three dimensional perspective as seen from your craft.

To fly the ship you move a red target along which looks like a radar window in the cockpit of a fighter. It is in fact a type of grid pattern, lining up longitude and latitude points and then pressing G to automatically flick your ship to the junction on the screen. In addition, two specially animated spaceflights have been preprogrammed into your ship.

By pressing S your ship will go to a low altitude and scan across the solar system. When the animation is done, press O. This takes you back to the original destination settings. Press A and the ship will fly from 50,000,000 miles above Jupiter's orbit and approach the orbit of the earth. Now you are ready to explore and create your own stimulating journeys.

On the top of the screen is a diagram of the Sun and the seven nearest planets. The little blue star shows which planets you are looking at. Orbit distance from the sun and radius are in miles.

If you would like more information about each of the planets you choose to visit, Mercury, Venus, Earth, Mars, Jupiter or Saturn and would like to compare each to the other, you use the ship's Planetary Computer. To access the computer you press a number from 1-6. On top of the screen is the name of the planet, then its distance from the Sun in miles. Astrocalc is a special features which lets you make comparisons between planets.

Touring the Planets

We head deep into Leggo Land about this time as the written guide of the planets is spoken in childish language patterns with lots of "count how many mountains you can see on the Nullarbor Plains" sort of things. It starts to feel more like a Disney ride through the Mickey Mouse galaxies.

But this in no way undermines the true value of the *Visual Solar System* program. It is well thought out and the graphics, such as the course you follow along the orbiting planets around the sun are very effective and detailed.

As a beginner's guide to space knowledge and even as an enjoyable, educational pastime, digging the *Visual Solar System* cartridge out of the Family Pack box is a profitable experience.

Care of your Micro

If statistics show a computer can expect one fault every two years, you can be sure that somebody, somewhere, will collect ten years worth of failures in two months.

What can you do to lesson the chances of a breakdown? We've decided to take a look at some of the major causes of problems, and ways you can avoid them.

Static

Have you ever walked through a building with synthetic carpet and a dry air conditioned atmosphere? Often you'll receive a nasty "bite" as you reach for the door handle on the way out. Try the same thing in low lighting and you'll be amazed at how big a spark can be generated.

A similarly sized "bite" will send large computers into a state of limbo. Smaller home computers are also at risk.

Static can upset your computers memory, or damage floppy disks and tapes. Fancy losing your favourite game, or perhaps a school assignment?

Static electricity is caused by a surplus or deficit of electrons on a charged body. Problems occur when the body in question is yours.

Normally any static charge you build up is slowly dissipated into the atmosphere or lost to an earthed object upon contact. The dryer the air, the longer a static charge will remain upon you.

Solutions

Ensure that you are at the same potential as your computer before you touch any part of it. Or simply put, that you're on mutual ground. For example, touch the metal cabinet of your video monitor or some other earthed object such as the kitchen sink. Avoid picking up the static charge in the first place.

Static electricity is generated when two different materials are rubbed together. Shoe soles on carpet, trousers across upholstery, plastic rubbed with silk are examples.

Install your computer in an area with vinyl or wood flooring. Avoid carpet (particularly synthetic) like the plague. Carpet treatment chemicals are available for static reduction.

Dust! The cleaner's nightmare. It gets on and into everything, keyboards included. Switch contacts don't like it. There isn't a lot you can do about this one other than cover your computer when it's not in use and keep it in a relatively dust free environment.

Covers are available from most computer retail outlets for popular home computers. If you're having trouble finding one to fit your brand, contact Computermate on (02) 457 8518.

Smoke is also in the danger category. A smoke particle is about one quarter the size of a typical dust particle. Of similar size is the fingerprint left when the magnetic surface is touched by human fingers.

A human hair, dust particle, or other foreign object can render a portion of a disk unreadable.

Disks

As a general guide, do not expose floppy disks to the following: heat, magnetic fields, bending or other physical violence, dust, and greasy fingers. Avoid touching the bare surface with your fingers. Sneezing on the same area is a definite no - no. Never use them as a coffee mat, or frisbee!

Disks become less reliable with usage. Some sources suggest 25 to 30 hours of actual rotation. Keep backups and relegate heavily used disks to non-vital jobs after they have shown you long and faithful service.

Disks do shrink and expand slightly with the rise and fall of the temperature. Don't use a disk that has recently been roasting in the hot sun. Allow it to cool down to room temperature first.

Heat within the disk drive may cause inconsistencies. Make sure it is well ventilated, with easy air flow around the cabinet. In some instances it may be necessary to install a fan. Dick Smith stores sell a unit which is well suited to the job.

Heat

Your computer consumes electricity. Due to the laws of thermodynamics, this electrical energy is turned into heat. Energy can't be destroyed or created. It may only be transformed from one form to another.

Some silicon chips produce more heat than others. A Video Interface Controller in the Commodore 64 has a metal leaf spring pressing down on it to conduct heat away to the surrounding metalwork. Without this 'heat sink', the chip's temperature would climb to destructive levels.

Neither the VIC-20 nor the Commodore 64 have much case ventilation and it is not unusual for the C64's internal temperature to be 30 degrees celsius above the outside air temperature.

This simply means that to avoid heat related failure you must help your computer keep its cool.

Don't impede the air flow to the computer's already small ventilation holes. Always put the machine on a hard flat surface, never on a blanket or thick table cloth that could reduce the air flow. Keep the computer away from sources of external heat - reading lamps, sunlight, radiators.

Avoid operation when the temperature is extreme - especially during summer. Use a fan to ensure a steady air flow over the machine and keep operation to as short a time as possible.

Now, if you think this sounds a little extreme, remember, it's your computer that's going to suffer heat stroke and most commercial installations are air conditioned.

Another problem can be humidity. Should the humidity levels reach 100 per cent, moisture will condense on any available surface at or below the temperature which dew forms.

If this happens, corrosion can cause problems which often don't show up until it's too late.

The sorts of problems caused by condensation include unpredictable keyboards and intermittent failures caused by poor contacts in the multitude of metal to metal connections in the computer.

This problem is more significant in seaside areas due to airborne salt. The solution to this one? Avoid leaving your computer in a cold damp area. Make your computer room inside a warm dry house, avoid garages and other outbuildings.

I don't have to elaborate, but this is a terrific one for the computerist who is not well received by his better half in the lounge and looks destined for the chook shed.

Caring for your 1530 Datasette

Santa Claus delivered many C64s this Christmas to families without any previous experience with a home computer. The first problem the new owner is likely to encounter will be ?LOAD ERROR, when trying to LOAD from the Datasette. This will most likely occur when trying to load a program saved on a friend's system.

The 1530 Datasette small manual (operating instructions) on page 3 details that it is important to keep the Datasette at least two feet (61 cm for the younger readers) away from the TV, because radio emissions from the TV can interfere with the correct operation of the Datasette. This is correct, expecially when loading long machine language routines. However, many load problems occur because of Datasette head alignment.

Azimuth head alignment

The read/write (R/W) head on a Datasette can be out of alignment and cause ?LOAD ERROR especially when loading programs prepared on another Datasette. The following Datasette Azimuth R/W Head Alignment procedure can be carrried out by the average person with little trouble, providing care is exercised.

Step 1. Remove any tapes from the Datasette.

Step 2. Press play on the Datassette. Place a mini flat tip screwdriver (available from Dick Smith Electronics CAT T-4010 for 55 c) in the R/W head alignment hole and turn the azimuth screw a quarter turn either clockwise or counterclockwise. Take care to remember where your Datasette was adjusted so you can return to your original setting, if required. A slot cut into the top of the handle of the mini screwdriver helps.

Step 3. Place a tape in the Datasette and LOAD the program. If a ?LOAD ERROR appears go a quarter turn the opposite direction from the first adjustment. Experimenting with the azimuth adjustment should reward you with a correct LOAD.

To save programs you should set your R/W head to an adjustment that allows commercial programs to LOAD with no problems. This will ensure that all your programs, both commercial and otherwise, load correctly.

Alignment using an oscillloscope

For those who are a little technically minded and have access to an oscilloscope, the azimuth adjustment is much easier.

Step 1. Using a Philips head screwdriver, remove the four screws from the bottom of the Datasette.

Step 2. Separate the case. The Datasette hardware is mounted to the top section of the case.

Step 3. Locate the Test Point (TP) on the component side of the Printed Circuit Board (PCB). The TP has a wire ring on it and is located in the middle of the PCB.

Step 4. Connect the oscilloscope probe to the TP, load a tape and press PLAY. Adjust the azimuth for maximum amplitude on the oscilloscope. The waveform will be varying in frequency but should be centred just over 2KHz, with an amplitude of about 1 volt.

Datasette alignment kit

The Commodore Information Centre have a complete alignment kit for the 1530 Datasette which is available for about $30 plus post and packaging $3.

This kit includes a small speaker that connects to the edge connecter located on the Datasette PCB. The head azimuth is adjusted for maximum amplitude (volume) in the speaker. This method is not as accurate as using oscilloscope but would save time if you don't have access to the test equipment and swap a few tapes.

Rescuing programs from tape load errors

Programs are recorded twice and also include a header which contains information about the program, such as its start, end and file name.

When a program is loaded from the Datasette the first version of the program is loaded and then compared directly to the second version. Therefore if a ?LOAD ERROR is to occur past halfway of the recording, chances are that the program will run or can be saved onto a new tape, with the following POKEs, in the DIRECT MODE.

```
POKE46,PEEK(832):POKE48,
PEEK(832):POKE50,PEEK(832)
RETURN
POKE45,PEEK(831):POKE47,
PEEK(831:POKE48,PEEK(831)
RETURN
```

WARNING: if you get a ?LOAD ERROR, do not try to list the program. The computer will put two zeros where it thinks the program ends. You'll lose your first line link. You can try LISTING the program after the above POKEs have been completed. If the LIST looks okay, you should SAVE the program on a new tape, just in case there's a flaw in the original tape.

Mystery ground wire

The ground braid wire attached to the Datasette computer connector is not needed with the C64, nor is there any place to connect it. You should ensure that this wire cannot touch any of your computer's electronics via the edge connectors at the back of the C64, eg input/output port etc.

The easiest way to prevent this is to wind the braided wire around the Datasette cord and then tape it in place. If your Datasette is only used with the C64 or a Vic 20 then cutting it off is the best solution. It won't harm the Datasette or the computer.

Datasette maintenance

Only maintenance required with your Datasette is periodically (every 10 to 15 hours of tape playing) cleaning of the heads, if tapes of a reasonable quality are used.

Step 1. Turn the computer off.

Step 2. Press EJECT to open cover, then press PLAY to expose heads.

Step 3. Put tape head cleaner on one side of a cotton swab. Gently wipe the surfaces of R/W and ERASE heads. Scrub gently. Any buildup of tape oxide particles on or around the head gap of the R/W head may cause unreliable performance. Also clean pinch roller and other tape bearing surfaces if tape head cleaner is suitable for this purpose (check label).

Peripheral connections

A glance at the various empty sockets on your Commodore 64, and the uses they can be put to. How long will it take you to fill them all?

Ever since the introduction of the home sound system, or Hi-Fi as it is better known, man has been confronted with a whole collection of sockets, plugs, adaptors and ports with which it is possible to connect extra "things".

Some enthusiasts' prime objective, once they had actually purchased the centre of their system, was to have every spare jack on the back of their unit connected to some other device. The amplifier was invariably connected to a tape deck, graphic equaliser, turntable, tuner and perhaps a remote timer for recording music while the owner was out.

Well, times have changed.

Today many families are discovering the delights of a home computer. There may not be quite as many sockets and plugs, but each socket is considerably more complex. The room for expansion still exists.

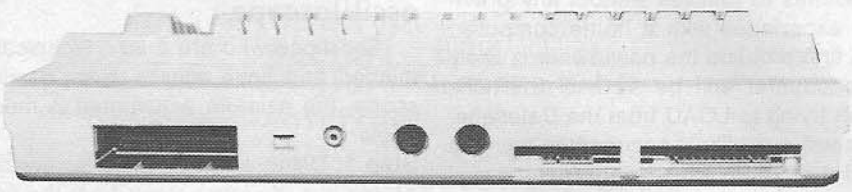
The extent to which satisfaction can be gained by watching the number of strange appendages grow is immense.

On your Commodore 64 you will no doubt have noted that the exact use of some of the ports or sockets on the back of the computer are less than obvious. You may also be surprised to discover some of the peripherals you can connect to the better known ports.

User Port

Starting from the left hand side of the computer, looking from the front, we come to the most mysterious hole on the Commodore 64. It is loosely named the "User Prt". Others refer to it as the RS-232 port or even the centronics port. So which is it?

It may be somewhat confusing to say it is all three. When in fact that is not entirely true. It does indeed allow you to connect an RS-232, centronics or user device. However, the necessary handshaking between the computer and anything connected via the user port may need to be enhanced by the use of some type of interface.



In practical terms you can connect a printer, modem, voice digitiser or synthesiser, security system or even another computer using the user port. It is very flexible with the right software to help out.

Cassette or Datasette Port

Next to the right. There's nothing tricky about this socket except that you may only connect a Commodore cassette player through it. Some printer interfaces also use the cassette port to draw power. Normally it is used for storing and retrieving programs onto tape at anything from 300 to 3200 bits per second - which means you can do it slowly or quickly.

Serial Port

Commodore designed this port for simplicity, not speed or power. Off it you can add a disk drive, printer, plotter or any other serial device. It transfers information to the desired peripheral in serial or one bit at a time. One of the beauties of the serial port is that devices may be daisy chained together. For example connect the disk drive to the computer and then the printer to the disk drive and so on.

Audio/Video Port

If you wish to add a colour or b/w monitor, or connect your computer to the home stereo, this is the place to start. Pure picture and sound signals come floating out of this socket. The standard Commodore monitor connects using a din plug to three RCA type plugs. Such a connection may be purchased at any Tandy Electronics store if the existing plug bites the dust.

UHF Out

From here a signal is waiting, much the same as the type of signal broadcast from TV stations, that will provide a clear image on your home television set once it is tuned to UHF channel 36.

Just further to the right is a small screw, which is a fine tuning knob if you like. If you have difficulty getting a good picture, have a bit of a twiddle.

Expansion Port

Also known as the Cartridge Port and the Memory Port. From here you will find all the vital life lines of the computer exposed for connection to all types of gadgets. The most common being an external ROM such as a games program or perhaps a machine code monitor, normally housed in a plastic cartridge. Printers, disk drives, synthesizers, drum machines and goodness knows what else may be connected here.

Control Ports

These are on the right hand end of the computer, and there are two of them side by side. They may also be referred to as the games ports. The first one allows you to connect a graphics tablet, paddles or joystick and the other a second joystick.

Well folks, that's it, we've run out. Fill them all and you will find peace of mind. Until then, the anxiety and frustration will remain.

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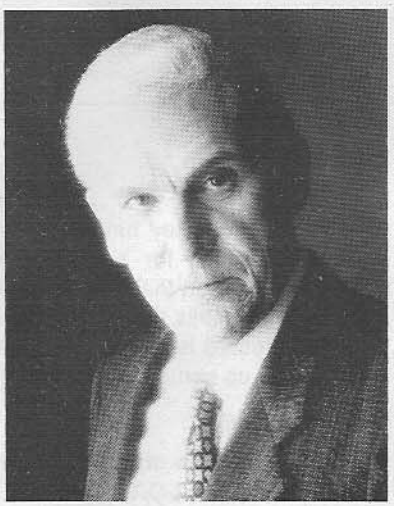

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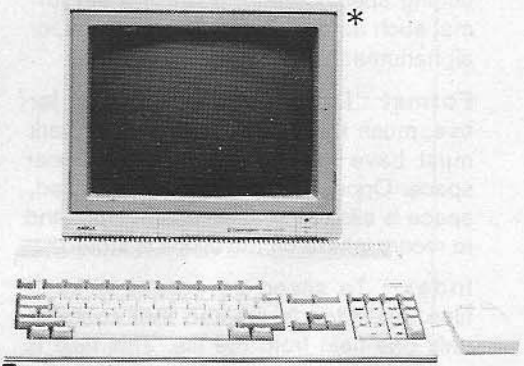

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The C64 in the Business world

Although the Commodore 64 was never designed as a business machine, it has earned itself a reputation as an inexpensive alternative to the real world of IBM compatibles.

For wordprocessing, filing and accounting there are dozens of applications to suit. In this section under the business heading we look at a popular database, *Electronic Card File* and also the Meridian Accounting Package. Both are true business products. Wordprocessing is handled elsewhere in this publication as a subject on its own.

One of the largest drawbacks of the C64 in the business world is the slow disk drive. There are ways of speeding this problem up (see disk drives), however some of these may not work fully with database software or filing programs.

Despite all this, small businesses will find the Commodore 64 a powerful tool for small day to day jobs. Its forty column screen is surprisingly useful when combined with the right program.

To help you in getting started in the Commodore business world, here's a glossary of commonly used terminology.

Business Glossary

Append : To add to the end of a file, or wordprocessing document.

Database : 1. The program that handles access to data, and enables you to manipulate and view it in a variety of ways. 2. The information or data stored as a file or group of files.

Directory : A list of files on a floppy disk.

File : An individual program, a wordprocessing document, database or part, is known as a file. There are a variety of file types including relative, sequential, and user.

Field : An entry within a database record placed in a field. The space allowed to enter information about a person or item or transaction. A mailing database may contain a field within each record to record the persons name. Another field may hold the persons address and yet another the post code. A field may be limited to containing specific information in a set format such as numbers, money, a date, or alphanumeric characters.

Format : Disks must be prepared for use, much the same as a new car-park must have lines marked for each car space. Once a disk has been formatted, space is allotted to store information, and to record where on the disk it is stored.

Index : To speed up access to large files, an index is created that contains only one field from the file. This field is then known as a key field and may be searched through for a specific entry much faster. When that entry is found, a special pointer tells the database where the whole record is stored. This method also speeds up sorting and reporting.

Key : see index

Menu : A selection of options or choices. For example to LOAD, SAVE or EDIT a file may be presented as a series of choices with corresponding numbers or letters which the user must press to select.

Purge : To erase or delete.

Random : A file accessed by record number, with no index or other reference information is known as a random access file. Any record may be read from the disk without having to read any precious records. Relative files are constructed in a similar fashion.

Record : A single entry, made up of field containing information about a product, person or transaction is called a record. A record is like a manilla folder on one person or item. Many folders or records make a file, or filing drawer.

Relational : A file may have information in it that links it to another file, creating a relationship between the two. A transaction file containing the client number, or product code is linked to the appropriate file which contains the description and other relevant information. A true database can handle relational files. Other databases are really only file managers.

Report : Information in a database may be printed by designing a report. The report is set to print certain fields from specified records matching a search criteria.

Relative : see random

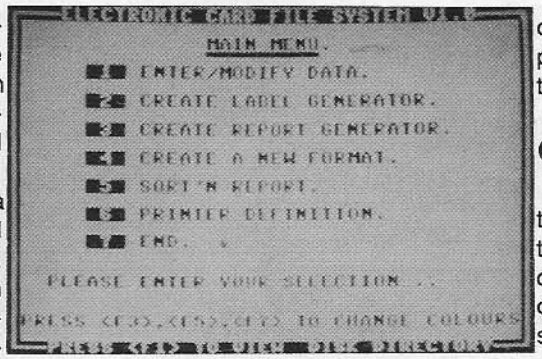
Search : To look and find a certain piece of information within a file, be it a database or wordprocessing document.

Sequential : A file stored with one record directly after another, regardless of length. Each record may be any length. Because of the unknown length of each entry, all previous data must be read to read a specific part of the file.

Sort : Place in alphabetical order or any other order as specified.

Validate : Check a disk for space wrongly allocated. NEVER validate a database disk!

Electronic Card File



Many programs that are called databases are nothing of the sort. They are jumped-up card files which have been manipulated to make them look like databases, although they do not fulfil even the basic essentials of that name.

It is a refreshing change to test a program which states quite clearly and accurately what it can do in the title. The program is *Electronic Card File* from United Computers. And its title describes precisely what it is - an electronic file.

There is a fair amount of evidence to show that most users only bother with about 20% of a complex database program. The other 80% goes unused simply because it is too difficult to learn, too intricate to handle easily.

With the *Electronic Card File* you should be using at least 80% of the program almost from the word go, because it is easy to understand and simple to manipulate.

The best way to think of the program is as an information and retrieval storage system. It is exactly like a real life card file, in which you enter information upon a series of linked subjects. But unlike a real life card file, with the *Electronic Card File* it is not your fingers that do the walking, it is the computer.This program differs from most in that the people responsible have enclosed an audio training kit in the form of a cassette tape to get you started. The tape is friendly, easy to understand and never condescending.

Program disk

Basically the software works through one program disk. You load this at the beginning of a session and then switch to your work disk for recording and saving information.

On the program disk are five samples. The first is a sample designed especially to be used in purely a training program, and once you have the hang of the system you will not need it any more. Then comes a mailing list, a record collection, a video collection and an asset register.

These are, of course, samples, and you can modify them to suit your specific needs.

For example, I could not care less about video. But I do have a very extensive library of computer books that I need to keep under some sort of control.

I started off by putting them in alphabetical order. Then I tried grouping them by subject. Now I have them on the *Electronic Card File* and can track down a title in an instant. Not that this will always be totally helpful.

For example, I see that three of my books on writing graphics programs for the Commodore have been borrowed by Andrew Farrell. When asked for their return he smiles an innocent smile and denies having borrowed them in the first place. But at least I know who has nicked them in the first place. Before I would have suspected the office cat, Hilary.

Work disk

The work disk, ideally, confines itself to one card design and one report/label page. If you like, you can create up to ten template card layouts and ten report pages on one disk which you can call, with remorseless logic, a template disk.

I don't see much point in this, as designing the card layouts and the report forms is extremely simple if you follow the quite clear instructions. It might be useful if you were using the program pretty well continuously, but I truly can't see that happening. Nevertheless, the facility is there if you want it.

Each card can hold up to 930 characters. Taking the average word as equalling six characters, that equals over 100 words, which is far more than you ever write on a file card. The number of cards you can hold on one disk depends totally on the number of words you are saving in each file card.

If you use the full 100 words you will get something around 130 cards. If you only use seven words for each report you can squeeze on 3,000. Both silly examples but they give you a rough idea of the potential capacity of one disk.

Clear instructions

The way the programmers have put the whole package together shows that they clearly understand the problems of dimwits like myself. For example, under "Planning Your Card and Input" they say:

"Take an old-fashioned pencil and paper and jot down a list of the information you wish to store.

"Rough out the design of the card you would be happiest with, making sure that you put information that you want to refer to quickly in a spot that your eyes go straight to.

"Give some consideration to the way you want the information put into Report Form.

"If you will be doing mathematical calculations, work out where on the Card the totals are to be shown. This is important as these areas need to be highlighted to help in ease of use."

(The next recommendation should be written in letters of gold and hung over the desk of everyone who is filing information, no matter what method they are using.)

"Don't keep information just for the sake of it, there are no prizes for having a Card so cluttered you can't make head nor tail of it."

(That is one of the great computer truths, and if the program teaches you nothing else it will have been well worth its price.)

"Do a couple of trial layouts before you make a serious attempt at your design.

"If your Card has data that is accessed frequently, consider putting that on the top of the Card and the input, such as name and address, that is a 'constant' factor at the bottom of the card. You will find that your day to day use of the card is a lot easier because you do not have to cursor down through this 'constant' information to get to the changeable data."

All sound robust good sense. It characterises the way that this program is written and operates - as a working tool, a means of making the Commodore 64

into an efficient information retrieval machine.

Are there any complaints?

One, just one. The book of instructions is typewritten in an extremely small typeface. But this is a trifling complaint. The simple fact is that *Electronic Card File* is one of those stout, utilitarian programs that actually do something, that make the computer into a useful tool rather than an interesting games machine. I commend it.

Price $49.95 Distributed by United Computers
(02) 295088

Meridian Accounting Programs

The amount of business software that becomes available for the Commodore 64 never ceases to amaze us.

Because programmers writing for the Commodore 64 have to work within restrictions of space, memory and a 40 column format, their ingenuity is taxed to the utmost.

The result is a series of elegantly written user friendly programs which dollar for dollar, leave the programs for larger, pure business machines for dead.

Let us look, for example, at the business programs which have been produced in New Zealand by Meridian Systems. Business programs that we get from New Zealand tend, on average to be superior to those we receive from other sources. This may be because, in New Zealand, the Commodore 64 is high in the market as a business machine.

There are five sections to the group of programs (Meridian call them modules which sounds much more expert). They cover the big five of accountancy - General Ledger, Creditors, Debtors, Invoicing and Sales Analysis, Stock Control.

Let us look at the components of the total system one by one and see the scope and the attention to detail which characterises this series.

General Ledger

This works under standard accountancy principles and maintains their accounts by allowing the operator to add, change, delete, query and print accounts.

Note that I say operator, for in truth neither a bookkeeper nor an accountant is needed to run these systems. Any reasonably intelligent person could have the system sorted out and up and running in a day.

It might require an accountant's advice as to which expense should go in which category, but after that it is all plain sailing, and this General Ledger will bring you to trial balance stage with ease. And with some flight adjustment will go even further.

Not only will it run the standard segments of the General Ledger but it will also maintain budgets - add, change, query and print budget figures. And at the same time it will also maintain financial reports - add, change, delete, query and print report definitions and reports. Transactions - that is when an order is accepted and the promise of money changes hands - can be entered in batches.

The program allows you to print batch lists showing every transaction in a batch or in a whole range of batches.

At the end of the month, at a date that you nominate, you can get a print-out of the trial balance complete with subtotals.

You can also at any time get a print-out of the General Ledger showing all transactions for all, or a range of accounts.

Having done that you can print financial statements including Trading Accounts, Profit and Loss Statements and Balance Sheets.

At the end of your standard accounting period you can set balances to zero and clear transactions prior to the next accounting period.

The program allows budgets to be carried forward for up to 12 months per account code.

To get all that on a general ledger system on a big machine would be considered a major feat. How Meridian have managed to cram it all so that it fits neatly into the Commodore 64 leaves me speechless with amazement.

The other modules also manage to achieve their results with elegance and, as far as I could ascertain without any corners being cut or any bugs left unsquashed.

Creditors System

With this section of the program the operator can maintain accounts - add, change, delete, query and print creditors. together with a list of available account numbers for allocation to new accounts.

When you load transactions you can log and approve creditor invoices for payment. You can also load journal and, a sad but necessrary happening, stop payments.

You can print payments lists, merge printing transactions by payment criteria.

You can print remittance advice forms for all of your creditors, for some of your creditors or for single creditors - as the mood takes you.

At the end of period you can age creditor transactions and remove or amend appropriate invoices etc.

This module will handle 200 creditors' accounts and provides analysis of payments into over 50 categories. As it happens I would like rather fewer accounts and rather more categories - but this is quibbling.

Debtors System

In this module you can maintain a complete accounting of your company's situation with its debtors. Again you can with ease and facility add, change, delete, query and print debtors. You have to hand a list of available account numbers.

You also have full control of all transactions and can input invoices, credit notes, journal entries or receipts.

A useful feature is that you can print a current aged trial balance report at any time during the month. And you can, of course, print statements for all, a range of, or individual debtors.

A ledger enquiry facility may be used at any time during the month to query the current state of the ledger.

At the end of period you can print the aged debtors' balances prior to loading transactions for the new month.

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* Programming commands of only 4 letters.
* Programmable 'NO-KNOCK' on Soft Errors.
* Programmable Write Verify ON/OFF>
* Programmable Number Of Header Gap Bytes (0-15).
* Programmable Drive Device Number (8-11).
* Full Auto Format Detection Code (AFDC).
* EASILY INSTALLED IN MINUTES!

Only $29 plus $4 postage and packaging.
1541 version $39 plus $4 postage and packaging

ACTION REPLAY MKIV

THE ULTIMATE BACKUP FOR C64/128

Action Replay Mk IV is more powerful, friendlier to use, and will backup more programs than any other computing utility . . . Guaranteed! No matter how it is loaded, once it is in memory, Action Replay will freeze the action giving the user access to Hi-res/Multi colour screens, Sprites, memory locations for Cheat Pokes, Sprite collision disable and backup to tape or disk at normal or Turbo speeds. Other features include; Sprite Monitor, Fast Format, Warp 25 Disk Turbo, Warp 5/10 Tape Turbo and Snapshot reload independent of the cartridge. Fully compatible with C64, 64C, C128, 128D, 1541, 1541C, 1570, 1571 and any true CBM compatible datasette or disk drive.

Fantastic Value at $99 + p&h

256K SUPEROM EXPANDER

* Now you can select from any of 8 8-32k eproms instantly!
* On board operating system - select any eprom from the main menu.
* On board unstoppable reset.
* Unique EPROM generator will take Basic or M/C programs and turn them into auto start EPROMs. ***ONLY $99 + p&h***

EPROMMER 64

* A top quality, easy to use EPROM programmer for the 64/128.
* Comes complete with instructions - plus the cartridge handbook.
* Fully menu driven software/hardware package makes programming reading/verifying/copying EPROMs simplicity itself.
* Will program 2716, 2732, 2764, 27128, and 27256 chips at 12.5, 21, or 25 volts. Fits into the user port.

ONLY $139 + p&h

DEEP SCAN BURST NIBBLER

* The most powerful disk nibbler available anywhere at any price.
* Disk Nibbler gets its power by implementing a parallel cable which transfers raw GCR Data to and from the disk drive without doing any decoding so you get a perfect copy of the original.
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3 SLOT MOTHERBOARD

* Accepts 3 cartridges - Individually switch any slot in/out.
* Fully buffered for cartridge port - On board safetly fuse and Reset.
* Includes table stand-off, all mounted on high grade PCB. ***ONLY $49 + p&h***

TATTS 45II

If you want to share part of the $300,000,000.00 that is won each year in Tattslotto, then this program is for you!

TATTS 45II is a completely self-contained program incorporating 6 sub programs which are used to perform a complete statistical analysis of the numbers you have chosen against past results. By following the guidelines as laid out in the 14 page manual accompanying the disk, you can select the higher chance numbers by analysing the number sequence history and repetitive groupings, thus improving your chances of winning. This program contains records of all past results since draw # 413 and can be expanded to cater for future changes to Tattslotto eg. 6 from 48 etc. All up, over 30 screens of statistical and analytical data are provided, plus much, much more.

ONLY $49.00 plus p&h

BLUE PARADE

This package really packs a punch! 2 double sided disks contain some of the raunchiest Hi-res animated cartoons and digitized screens, accompanied by exciting synthesised tunes such as 'touch me'. This electric bazaar is a must for any collection.

ONLY $29 plus p&h

**All mail order clients must include a signed and dated statement for declaring that they are over the age of 18 years.*

OCEANIC OC-118N

100% GUARANTEED 1541 COMPATIBLE DRIVE

* Slimline Construction
* One year warranty
* 100% Compatible
* Direct drive motor
* Heavy duty stepper
* Quiet motor & stepper
* Weight - 2.8kg
* Operating life 10,000 hours
* Solid metal chasis & case
* Device number switches
* External power supply
* Fast 6ms track step time
* All cables included
* Dimensions 268x150x47mm

INCREDIBLY PRICED AT JUST $299 plus p&h

Westend

(03) 350 5144

402 Bell St, Pascoe Vale Sth, Vic 3044

SPECIALISTS

MasterCard VISA

FREIGHT: Surface $3 Express $7
Airmail $5 Overnight $9

This balance-forward system handles up to 490 debtors.

Sales Analysis

This program is designed to help you to analyse what your customers are doing, which is absolutely essential for a healthy company. The purpose of accounting is not primarily, to keep the tax man happy but to give management a working tool so that they can see which way the company is going. Sales analysis is one way to keep a close eye on what the company is doing.

With this module you can adjust and print customer type analysis codes.

You can then add, change, delete, query and print sales analysis codes.

And then you can do the same for your invoice line analysis codes and your sales tax codes. This module also allows you to print and update monthly customer and sales analysis totals.

With the end of period you can reset month-to-date analysis figures and year-to-date analysis totals.

Stock Control

This program accommodates 1000 stock items, 99 suppliers and 200 stock movements per batch.

It features maintenance of the stock master file. You can add, change delete, query and print the current status of stock items. Same for your record of suppliers. You can update your records to keep track of stock orders, receipts, sales and transfers. You can print wholesale and retail price lists, which give you instant stock-take check lists. In exactly the same way you can print reports of stock on hand and stock on order.

By setting a minimum level for various items of stock you can allow your computer to generate a report of which items are below recommended levels - instantly.

A sales analysis is ever at hand.

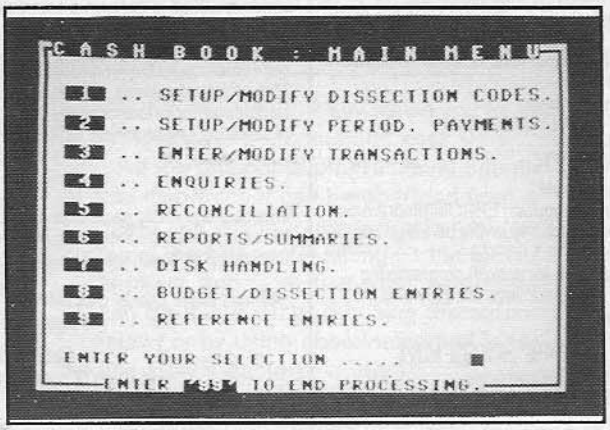
A zero sales and purchase analysis can be generated at, say, the end of the month or the year. Note that this is fully integrated with the debtors system and as a result will print out invoices and credit notes. I have, it is true, seen bigger, better and more comprehensive accountancy systems. But they were all for much, much larger machines and cost up to ten times as much.

Until someone shows me otherwise, the Meridian accounting package is the best value software currently available in accounting packages for any computer. That is a large claim and a tall statement. I can be proved wrong. But somehow I doubt it. The Kiwis who are responsible for this suite of programs can now move centre stage and take a bow.

For further information contact : Commodore Business Machines on (02) 427 4888. Each module $99 for C64 and for 128 $149 each.

Electronic Cash Book

The *Electronic Cash Book* is designed for people with or without accounting experience to keep records of cash flow. Then if required, the details can be used to write the general ledger or handed to your accountant to do.



In the book keeper's jargon, the cash book is a prime entry book and the most hard-worked. Unlike manual methods, the tedious searching and corrections are swiftly and accurately performed and nowhere is the advantage of computer over manual methods more obvious than at this level.

The program enables owners of C64/ disk drive or SX64 computers to make theirs a fully fledged business machine. The system allows for 60 dissection or disbursement codes. Codes enable you to divide each cheque or deposit into various columns, 'car payments', for example. Each transaction can be divided or allocated to five different columns. Just punch in the number and the computer does the additions, leaving less room for error and making entry much more convenient.

570 transactions are possible over a three month period if the disk is aged monthly. A new disk for records should be made each month, although this is not obligatory. An audit trail can be selected, and budgets can be entered and/or modified for every dissection code.

A complete list of monthly peridoical payments for each financial year are possible, such as car lease monthly payment for example. Once entered the system keeps a complete record, including bank reference number, lease number, payee, expiry date, amount paid to date, amount outstanding, bank charges, and monthly payment amount.

This program offers superb value for money.

The handbook is well written with an overview of each option, followed by clearly worded instructions, but if you do get into difficulties, United Computers offer a help hotline that really does help, surely unique among software houses.

Available from all good Commodore dealers and mail order houses. For further information, contact United Computers on (02) 295 088.

Price $99 for C64 and $129 for 128.

Communications - a whole new world

Using the C64 and a modem, a whole new world is opened up. The modem allows information to be transmitted over the public telephone network. This means you can contact other users to swap programs, or send messages.

Dedicated computer systems are setup as electronic bulletin boards. Most are free to access, and the few that require a joining fee charge $20-$30 per year. Once connected, a menu is displayed which allows you to send and receive messages specific users, or to all the users. Hundreds of programs are available to be transferred to your computer over the phone, providing an excellent source of free software.

To get started you'll need two things.

1) A MODEM (MOdulator/ DEModulator) changes the information stored in your computer into a series of audible tones that are sent down the telephone wire. The process is similar to that which takes place when a program is stored on cassette tape.

2) A terminal program. This lets your computer talk to the modem and in turn to other computers. Various levels of sophistication allow more complex operations such as file and program transfers, referred to as uploading and downloading. It's also possible to have remote access to your equipment from another computer.

Searching for the best buys is a tricky task. Dozens of brands with vast differences in ability exist. At the most basic level, the biggest variation is the speed at which these little black boxes can send and receive information.

This is measured in bits per second or the baud rate. In common practice most home users will use either 300 or 1200 baud, which is roughly equal to 30 or 120 characters per second respectively.

Around 30 characters per second is the speed at which most people read. However the faster speeds are very useful, especially in transferring files or programs.

Viatel

Viatel, a service provided by Telecom, uses a special 'split' baud rate, where the sending and receiving speeds are different. Information is received by the user at 1200 baud, but sent at a sluggish 75 baud. This is fine when mainly viewing or retrieving information.

A massive number of service providers are accessible from Viatel. Banks, Finance Companies, Travel Agents, Stockbrokers, Statistics companies, and TAB are but a few of the many available. There's also a wide selection of news services, and special interest groups.

To access Viatel you'll need a modem that handles V23. What's the V23 stand for?

The various combinations of speeds are often represented by the following codes :-

V21 - 300 Tx / 300 Rx CCITT
V22 - 1200 Tx /1200 Rx CCITT
V22bis - 2400 Tx / 2400 Rx CCITT

Which Modem?

Modem	RR	Baud Rates	Operation	Distributor
Cicada 300	$110	300	Manual	Centre Industries
Cicada 312	$245	300, 1200/75	Manual	Centre Industries
Nice Modem	$279	300,1200/75	Manual	Nice Computer Co.
Nice Modem (C64 only)	$299	300,1200/75	Manual	Nice Computer Co.
Micromodem III (C64 only)	$299	300,1200/75	Manual	Acme Software
Netcomm 3+12	$341	300,1200/75	Manual	Imagineering
GPA Supermodem	$395	300,1200/75	Auto, Hayes	Micro-Educational
Wellcon 7012d	$499	300,600,1200/75	Auto, Hayes	Techsoft
Netcomm Automodem 21/23	$549	300,1200/75	Auto, Hayes	Imagineering
Lightspeed	$599	300,600,1200	Auto, Hayes	Techosoft
Netcomm Auto 12+12	$699	1200/1200 only	Auto, Hayes	Imagineering
Nicemodem II	$799	1200/75,1200	Auto, Hayes	Nice Computer Co.
Netcomm Automodem 123-A	$925	1200/75,1200/1200	Auto, Hayes	Imagineering

V23 - 1200 Tx / 75 Rx CCITT
V23org - 75 Tx / 1200 Rx CCITT (V23 set to originate)
B103 - 300 Tx / 300 Rx BELL(US)
B212 - 1200 Tx / 1200 Rx BELL (US)
(Tx = Transmit, Rx = Receive, CCITT - Australian Standard)

Cheaper modems support only 300 baud or perhaps 300 and 1200/75. This should suffice for starters. Once you've been treated to a dosage of 1200 baud, you'll be sold on the higher rates of operation.

Top of the line units are capable of most speeds currently in use, as well as a few rather rare combinations. They also support what is known as the HAYES command set.

This is a set of short instructions which allow you to COMMAND and PROGRAM your modem to do certain things. For ease of use, and flexibility, I normally recommend a hayes modem. Fortunately these have of late dropped in price to under the $500 mark.

Non-Hayes compatible modems sell for as little as $110, but provide far less power potential.

Autoanswer/autodial

Other features to consider are autoanswer and autodial.

With autodial you may simply enter a number into your computer, and then the modem will dial it for you automatically. This is very useful for accessing popular numbers which are continually engaged. It also allows you to maintain a phone book of systems, and simply choose the one to access at the press of a key.

Autoanswer is primarily used by people who allow remote access to their own equipment. You can set your modem to answer the phone after a prescribed number of rings.

I approached most of the leading suppliers of modems to compile the price/feature guide of what's available. Unless stated as being a C64 only modem, all allow connection via the standard RS-232 port.

Commodore owners wishing to connect an RS-232 modem will require an interface. Often suppliers have a Commodore version available for an additional $15-$35. These connect directly to the User Port.

Cables and software can add dramatically to some of the prices, as can the need for an interface of some description.

Smart modems offer more power, but tend to need more know-how to operate. Occasionally you may run into difficulties getting two smart modems to talk to each other.

A few models are expandable by way of piggy back boards, and expansion slots. In general, think carefully of what you'll need to begin with, and then make an informed purchase.

Have a look at a few setups operating, including the various speeds of operation. Few stores have units up and running, and in general, even fewer are terribly well informed on the subject.

Software is not readily available. A few modems include bundled packages, however little is available in the way of off the shelf terminal programs. User Groups are often a good source of public domain programs. Check out the listing toward the back of this publication.

The word modem is a contraction of two words; MOdulator and DEModulater. To modulate means to adjust or vary tone or pitch (as in a speaking voice), or to alter amplitude, frequency or phase of a wave using a wave of a lower frequency to convey a signal. Demodulation is the separation of the modulated signal into the modulating wave and the wave carrying the information for the terminal to process. As the names imply, demodulation is just the opposite of modulation. For most telephone modems, a form of frequency modulation is used.

The telephone lines have been set up to handle voice communications. Therefore they can only handle a limited frequency range. The high speed clicks that a computer uses to communicate will not carry over these line, so it is necessary to convert these clicks into something that the telephone lines can handle. The modulation process mixes in a lower frequency audio signal, creating a signal that can be reliably transmitted over phone lines. When the signal reaches its destination, it is demodulated and the desired signal is separated from the modulating frequency.

There are many different types of modems and communication 'protocols' but the one used most often by people with home computers is a 300 baud modem.

Half & Full Duplex

There may be some confusion regarding use of the terms "half duplex" and "full duplex". The definitions above are commonly used, since data is usually echoed back for the host computer in a full duplex system and echoed locally by the modem or terminal in a half duplex system. Usually, but not necessarily. The terms actually refer to the communications circuits themselves, not the communications protocols.

The true definition of a full-duplex system is one which allows data to be sent and received simultaneously; BELL 103A type modems are full duplex, since they use separate frequencies for send and receive. In half-duplex communications, the modem can either send or recieve, but not at the same time. (A third system exists called simplex, which allows one way transmission only.)

The system of printing characters as they are echoed back from the host computer is called "echoplexing". What's called "half duplex" mode on most modems actually enables modem local copy, where the modem echos everything back to the terminal locally. Alternatively, the terminal itself can print each character as the keys are struck, and the modem need not echo locally - and thus can be used in its "full duplex" mode.

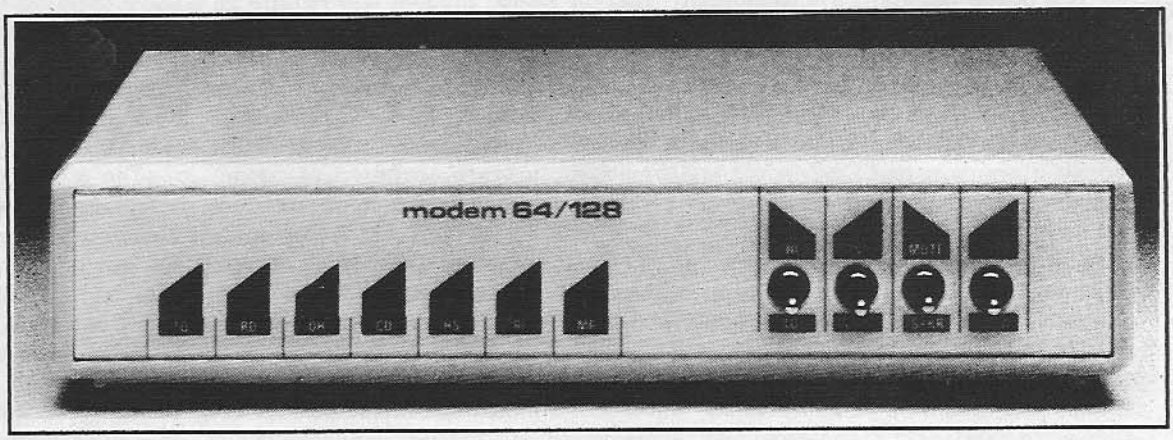
It all boils down to this: If the host computer echos back everything it receives, your modem doesn't have to echo - it should be set to "full duplex mode". If the host computer doesn't echo back each character it receives, the terminal itself must be set up for local copy, or the modem may be set "half duplex" mode where it echos back locally.

The RS232 Interface

The standard interface used in data communications is the serial RS232C. This interface has an operating range of 0 to 20,000 baud synchronous and asynchronous. Synchronous communications is used with systems that have special 'protocols'. Most IBM equipment uses this form of communication. It is most suitable for sending large quantities of information at once. Asynchronous communications is suited to sending single characters. This is the type of communications available with most 300 baud host computers such as a BBS.

The RS232C standard involves two connectors, a male and a female. In general, (but not always) the female connector is used on the DCE (data communications equipment, i.e. the modem) and the male connector is on the DTE (data terminal equipment i.e. the terminal).

Netcomm's Modem 64/128



Using a Netcomm 64/128 modem, you can switch on your computer, LOAD the software included, press two keys, and be on-line to your favourite Bulletin Board or Viatel.

Dialling, baud rate selection and connection to the system is handled entirely by the modem and software - there's no need to intervene.

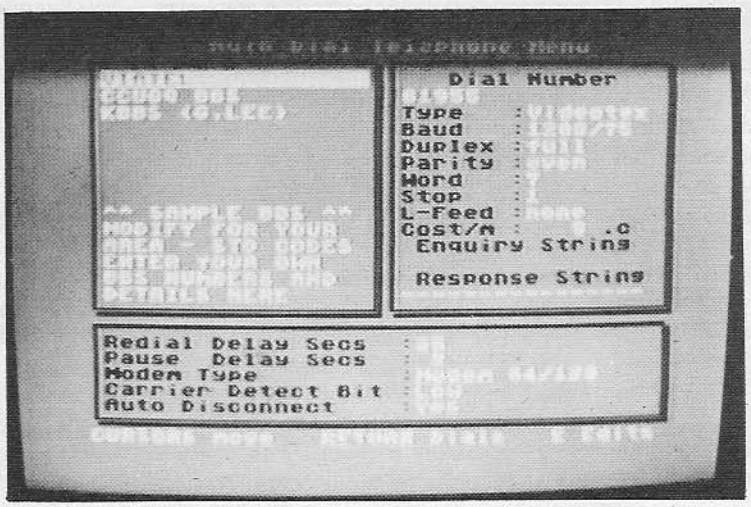
Placed neatly beside my C64, the modem looked very much at home, blending in nicely with the cream colour of my Micro Accessories replacement case. On the front panel are four switches, and seven LEDs, sparingly distributed along the rather small length of just a little over 16 centimetres.

Having loaded the terminal program, otherwise known as *GP Term*, from disk at turbo speed thanks to the built in fast DOS, control of the various operations is achieved by way of the function keys.

Videotex pages may be captured, an auto-dial menu edited and saved, baud rates fine tuned, and programmable keys defined. And that's just the start. I would compare the facilities of this package with *VIP Terminal*, only that this one is slightly better in that it offers Videotex access.

The telephone menu provides space for your 14 favourite numbers, and associate details. I include a comment to jog my memory as to the system's calibre and availability - important when trying to decide which to call next after the previous call was busy. If you don't like redialling manually, the software will automatically retry up to five times before requiring operator intervention.

Documentation is adequate, however the print size is way too small for true hackers, whose diminished eyesight is an equally great hindrance when travelling in automobiles.



GP Term has so many smart features I could fill another page just naming them. A very carefully thought out package that shows the results of testing, and usage by programmers who were interested in more than simply producing a run of the mill terminal program.

Coupled with Netcomm's modem technology that won them the Australian Hardware Division First Prize in 1985, the entire package packs a mean punch at less than $300, excluding tax.

Communications Glossary

Acoustic Coupler: A device that allows modem-generated audio signals to be transmitted into and received from a telephone handset. The handset is placed into rubber cups on top of the coupler. A small transducer at the bottom of the cups produces the actual signal.

ACK: Acknowledge. Yes, I received that last byte, or string of bytes. Normally only used in file uploading or downloading.

ASCII: American Standard Code for Information Interchange. A seven-bit code used widely in data communications to transmit the letters of the alphabet, plus the standard punctuation marks and certain control characters. Every character has a corresponding numeric value that is common on most home computers. This allows different types of machines to speak with each other.

Auto-answer Modem: A modem that can answer an incoming call by generating a carrier tone that signals the originating modem its call has been received.

Auto-dial Modem: A modem that can simulate a telephone dialer using either pulse or touch-tone dialing signals.

Austpac: Packet switching network provided by Telecom. Allows computers which talk at different speeds and languages to exchange information.

Baud: A speed expressed in bits per second transferred over a communications line. 300 baud is roughly 30 characters per second.

Bell: The American standard for data communications.

Binary: Place where rubbish is stored. Or in computers, a number system using base two rather than base ten as in decimal.

Bit: What the dog did. Short for binary digit (either 1 or 0), the elemental unit of digital information. Every character is made up of several bits (usually eight). A bit is either one or zero, corresponding to pulses that may be transmitted audibly on telephone lines.

Buffer: Often called capture buffer. In general, a temporary storage place for data. A capture buffer is temporary storage for data "captured" from a communications link.

Bulletin Board: A computer you can access via modem especially for leaving messages to other users. Various subject areas are available, and normally programs can also be uploaded or downloaded.

Byte: What a dog does. On an eight bit computer, eight bits make up a byte. Usually one byte is equivalent to a character. Each character in the ASCII set can be represented by only seven bits. Thus, a byte can be thought of as equivalent to a character for approximation purposes only.

Carrier: A steady signal that can be changed in tone (modulated) to transmit data.

Checksum: Used as a test for the integrity of information transmitted by any means where corruption may take place.

Control Characters: ASCII characters that do not print out, but are used to control communications. Control characters can, for example, signal a sender to stop transmitting information when the receiver is busy.

Data: Information in code, text or numerical form, generally represented in ASCII code for digital communications.

Database: A file or program which contains information in a specially formatted way. Normally made up of records and fields which are roughly equivalent to a card file system.

Download: Transfer a file from another computer to your computer.

Duplex: Refers to the two-way nature of modem communications. In full-duplex communication, both terminals can send and receive simultaneously. In half-duplex operation, both ends can send and receive, but not at the same time. With full-duplex, echo-back communications, a transmitted character is not displayed until it has been verified by the receiver.

Electronic Mail: Messages directed to a specific user on a Bulletin Board system. A personal message, similar to mail.

Frequency: The number of cycles of an oscillating waveform that occur each second.

Glitch: Hiccup on the telephone line. Some information may be garbled making it unreadable.

Hayes: Command language for programming some modems.

LF: Line feed. Moves the curser to the next line.

Modem: A device that modulates audio tones to carry digital signals and also demodulates the signals at the receiver so they can be understood by a computer.

NAK: Negative Acknowledge. Used in file uploading/downloading.

Noise: Random disturbances that degrade or disrupt data communications, present to some degree in all transmission links.

Originate/Answer Modem: A modem that can either start a telephone call or receive one automatically. Some modems automatically assume originate or answer status, others require manual switching to the proper state.

Parity: A means of checking for errors by adding an extra bit to each ASCII character transmitted.

Protocol: A set or rules for the transmission of data. Protocols describe when transmission will start and stop, what error checking system is in effect and the like.

RS-232: A standard for transmission of serial data covering both hardware configurations and transmission parameters. Different manufacturers may implement some or all of the RS-232 standard in their communications products.

Serial data: Data sent one bit at a time, as opposed to parallel data sent several bits at a time. Modems operate on serial data.

Sysop: System Operator. The person who is responsible for the smooth operation of a particular remote access system such as a Bulletin Board.

Teleconferencing: Several people get together to talk via electronic means, either telephone or computer, about a particular subject. Often used in multi-user remote access systems.

Terminal: A device that receives or transmits digital information. Communications software is designed to control computers during terminal mode operation.

Upload: Transfer a file to another computer.

X-ON/X-OFF: A protocol for pausing data transmission using simple control characters.

BBS Bulletin Boards

N.S.W.

System Name: ABCOM
Phone: (047) 36 4165
Sysop: Ben Sharif
Hours: 24 Hours
Baud Rates: V21. V22. V22bis V23
Access: Mem/Vis
Machines: IBM XT
BBS Software: FIDO
Comments: FIDOnet (713/304)

System Name: Ace BBS
Phone: (02) 525 9130
Sysop: Larry O'Keefe
Hours: 24 Hours
Machines: Atari

System Name: Alcoholics Opus
Phone: (02) 588 8804
Sysop: Michael Aldiholic
Hours:2100-0600m/f 24hrsw/e
Baud Rates: V21. V22.

System Name: Andromeda RRAPL
Phone: (02) 764 3598
Hours: 24 Hours
Access: Public

System Name: Apple Users' Group BBS
Phone: (02) 451 6575
Sysop: Matthew Barnes
Hours: 24 Hours
Access: Mem/VA

System Name: Arco-Tel BBS
Phone: (02) 683 3956
Sysop: Alex Sardo
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23
Access: Mem/Va
Machines: XT CLone
BBS Software: Opus
Comments: FIDOnet (713/601)

System Name: Arrow KBBS
Phone: (02) 451 2660
Sysop: Mark Sinclair
Hours: 24 Hours
Baud Rates: 300/450
Access: $20 pa. Mem/Vis
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: Augur TBBS
Phone: (02) 661 4379
Sysop: Mark James
Hours: 24 Hours
Baud Rates: V21.V22.V22bis.V23
Access: Reg/VA
Machines: PC Clone
BBS Software: TBBS 2.0m
Comments: Additional line - (02) 311 3052 V21

System Name: Ausborne (Osborne) RCPM
Phone: (02) 95 5377
Sysop: Daniel Moran
Hours: 24 Hours
Access: Public

System Name: Ausborne Users Group RCPM
Phone: (02) 568 2791
Sysop: M. McGlynn-Worthington
Hours: 24 Hours

System Name: Auzline BBS
Phone: (02)688-1006
Sysop: Chris Pattison
Hours: 10-5 WD 10-8 WE
Machines: Commodore

System Name: Balmain RCPM
Phone: (02) 660 8182
Hours: 24 Hours
Access: Reg/VA

System Name: Bert
Phone: (02) 211 0855
Hours: 24 Hours
Comments: (1200/75)

System Name: Breside Omen
Phone: (02) 457 8281
Sysop: Geoff Arthur
Hours: 24 Hours
Access: Public

System Name: C S A C E (Atari)
Phone: (02) 529 8249
Sysop: Larry O'Keefe
Hours: 24 Hours
Access: Reg/VA

System Name: CLUB AMIGA BBS
Phone: (02) 521 6338
Sysop: Ross Kellaway
Hours: 24 Hours
Access: VIS/MEM
Machines: COMMODORE AMIGA & C64

System Name: Club Mac BBS
Phone: (02) 73 1992
Sysop: Jason Haines
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23
Access: Mem/LVA
Machines: Macintosh
BBS Software: Red Ryder

System Name: Club-80 (SYDTRUG) RTRS
Phone: (02) 332 2494
Sysop: Michael Cooper
Hours: 24 Hours
Access: Mem/VA

System Name: Comet BBS
Phone: (02) 599 7342
Sysop: Eric Davis
Hours: 24 Hours
Baud Rates: 300 Baud
Access: $15 pa Membership
Machines: Commodore
Transfers: Midwesterm
BBS Software:CBM Ascii half duplx
Comments: Ultraterm - Commodore ASCII

System Nam: COMboard 068
Phone: (068) 47 1197
Sysop: Gary Edwards
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: XModem
BBS Software: COMboard

System Name: Comm-Link
Phone: (043) 413 135
Sysop: Jeff Campbell
Hours: 24 Hrs
Comments: Commtel, V21, Vast range of transfer protocols.

System Name: Comm Link BBS
Phone: (02)875-4817
Sysop: Michael Hayter
Hours: 24 Hours
Access: Mem
Machines: Commodore

System Name: Commodore 64 KBBS
Phone: (02) 664 2334
Sysop: Graham Lee
Hours: 24 Hours
Baud Rates: 300/450 Baud
Access: $25 pa Membership
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: Commodore Pursuit KBBS
Phone: (02) 522 9507
Sysop: Warren Hillsdon
Hours: 24 Hours
Access: VA/Members
Machines: Commodore 64

System Name: Contact BBS
Phone: (02) 798 6368
Sysop: Peter Hall
Hours: 24 Hours
Baud Rates:V21. V22. V23. B103 B212
Access: Mem/LVA

System Name: Contact RCPM
Phone: (02) 550 0984
Sysop: Steven Williams
Hours: 24 Hours
Access: Mem/LVA
Machines: All (Amiga Section)
Comments: 300, 1200 and 1200/75 baud.

System Name: Datacomm KBBS
Phone: (02)643-1220
Sysop: James Butler
Hours: 24 Hours
Baud Rates: 300/450 Baud
Access: $20 pa Membership
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: DefCom KBBS
Phone: (02) 764 3949
Sysop: Jere Lawrence
Hours: 9.30 pm - 7.30 am
Baud Rates: 300/450 Baud
Access: Free
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: Dick Smith RIBM
Phone: (02) 887 2276
Sysop: Steven Engel
Hours: 24 Hours
Access: Public

System Name: Dreamtime FRP BBS
Phone: (02)93-5225
Sysop: Chris Geddes
Hours: 9.30pm - 7.30am
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: N/A
BBS Software: Role Playing BBS

System Name: Edge of Darkness
Phone: (02)522-7919
Sysop: Andrew Levell
Hours: 24 Hours
Baud Rates: 300/450 Baud

BBS Listing

Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: Frontier Systems RIBM
Phone: (02) 875 2606
Sysop: John Stanton
Hours: 24 Hours EST
Access: Public

System Name: Galaxy (Apple) BBS
Phone: (02) 875 3943
Sysop: Chris Nelligan
Hours: 24 Hours
Access: Public

System Name: GCS
Phone: (02) 570 9861
Sysop: Mark Ivanhoe
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23

System Name: Goblin Sound RMAC
Phone: (02) 660 8182
Sysop: Ned Whitford
Hours: 24 Hours
Access: Reg/LA

System Name: Hackers Haven
Phone: (02) 609 3487
Sysop: Mark Pace
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
BBS Software: Role Playing BBS

System Name: Hide-Away KBBS
Phone: (02) 750 0750
Sysop: Anthony Rutter
Hours: 24 Hours
Baud Rates: 300/450 Baud
Access: Free
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: Idiom
Phone: (02) 438 4060
Sysop: Stephen Beeby
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23
Access: Reg/VA

System Name: Illawarra BBS
Phone: (042) 84 4354
Sysop: John Simon
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: All
Transfers: Xmodem
BBS Software: COMboard

System Name: Infor-Centre BBS
Phone: (02) 344 9511
Sysop: Paris Radio
Hours: 24 Hours
Access: Mem/VA

System Name: Irata BBS
Phone: (02) 600 9041
Sysop: Paul Sommers
Hours: M/F1800-0000 24H W/E

System Name: Keeboard TBBS
Phone: (02) 629 2230
Sysop: Phillip Keegan
Hours: 24 Hours
Access: Public

System Name: Lodestone BBS
Phone: (02) 456 3264
Sysop: Ian McWhirter
Hours: 24 Hours
Baud Rates: V21. V22. V22bis B103
BBS Software: Opus
Comments: FIDOnet (711/407)

System Name: Manly BBS
Phone: (02)977-6820
Sysop: Chris Patten
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: Midwesterm
BBS Software:CBM Ascill Half Dplx
Comments: Ultraterm

System Name: Matrix BBS
Phone: (049) 38 5057
Sysop: Andrew Pike
Hours: 24 Hours
Baud Rates: V21
Access: Mem/Reg/LVA
BBS Software: KBBS

System Name: Mi Computer Club RCPM
Phone: (02) 662 1686
Sysop: Your Computer Mag
Hours: 24 Hours
Access: Mem/VA

System Name: Micro Design Lab RCPM
Phone: (02) 663 0151
Sysop: Steven Jolly
Hours: 24 Hours
Access: Public

System Name: Microlink Commodore BBS
Phone: (02) 477 7509
Sysop: Tony Callahan
Hours: 24 Hours
Access: Free
Machines: Commodore

System Name: Microlink BBS
Phone: (02) 477 7509
Sysop: Tony Callahan
Hours: 24 Hours
Baud Rates: V21 V22
Access: Public
Machines: C64
BBS Software: BBS64

System Name: Newcastle Microcomputer Club RCPM
Phone: (049) 68 5385
Hours: 1700-830wk24HrESTwe

BBS Listing

System Name: Omega Line/ Breskie Omen
Phone: (02) 457 8281
Sysop: Geoff Arthur
Hours: 24 Hours
Access: Public
Comments: (300/300 & 1200/75)

System Name: Omen RTRS
Phone: (02) 498 2495
Sysop: Ted Romer
Hours: M-F 1630-900F-M24Hrs
Access: REG/V
System Name: Oracle TBBS
Phone: (02) 960 3641
Sysop: Rowan Evans
Hours: 0000-1800wd0000-0600

System Name: Ozi BBS
Phone: (02) 389 7130
Sysop: David Drahos
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: Xmodem/Punter
BBS Software: OZI BBS Software

System Name: Palantir BBS
Phone: (02) 451 6576
Sysop: Steve Sharp
Hours: 24 Hours
Baud Rates: 300/1200/v23 -1200/75
Access: Free
Machines: Commodore
Transfers: Punter
BBS Software: Punter BBS V64.4
Comments: Bobsterm/Supercom

System Name: Phantom Land KBBS
Phone: (02)399-7716
Sysop: Bob James
Hours: 24 Hours
Baud Rates: 300/450 Baud
Access: Free
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: Prophet TBBS
Phone: (02) 628 5222
Sysop: Larry Lewis
Hours: 24 Hours
Baud Rates: V21.V22.V22bis.V23
Access: Public
Machines: XT Clone
BBS Software: TBBS 2.0m
Comments: FIDO net 713/600

System Name: Pursuit KBBS
Phone: (02) 522-9507
Sysop: Warren Hillsdon
Hours: 24 Hours
Baud Rates: 300/1200/V23-1200/75
Access: $20 pa Membership
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: RCOM BBS
Phone: (02) 667 1930
Sysop: Simon Finch
Hours: 24 Hours
Baud Rates: 300 Baud
Access: $20 pa Membership
Machines: Commodore
Transfers: Midwesterm
BBS Software: RCOM (CBM Ascii)
Comments: Ultraterm Requires Rterm

System Name: RUNX Unix System
Phone: (02) 48 3831/4871860
Sysop: Mark Webster
Hours: 24 Hours
Access: Mem/LVA
Comments: (1200/1200) (1200/75) (300 Baud/4 Lines) (Voice)

System Name: Sentry BBS (VIC 20)
Phone: (02) 428 4687
Sysop: Trev Roydhouse
Hours: M/F 2100-0600
Access: Public
Comments: Sat - Sun 2000-0600

System Name: Shore BBS
Phone: (02) 959 3936
Sysop: David Kok
Hours: 1800-0730m/f 24hrw/e
Baud Rates: V21
Access: Reg/VA
Machines: Macintosh
BBS Software: Red Ryder

System Name: Skull Apple ABBS
Phone: (02) 529 89750
Sysop: Les Ayling
Hours: 24 Hours
Access: Reg/VA

System Name: SMUG BBS
Phone: (02) 607 7584
Sysop: Bob Fryer
Hours: 24 Hours
Access: Reg/VA

System Name: Software Tools
Phone: (02) 449 2618
Sysop: Bill Bolton
Hours: 24 Hours
Baud Rates: V22bis.TrailBlazer
Access: Reg/Va
Machines: Sharp 7501 At
BBS Software: Opus
Comments: FIDOnet (711/403)

System Name: Sorcerer RCPM
Phone: (02) 387 4439
Sysop: John Woolner
Hours: wd 1800-0800 EST
Access: Mem/VA
Comments: **OFF AIR*** (Ring Back wd) W/end 24 Hrs

System Name: Sorcerer Users Group
Phone: (02) 626 8020
Sysop: John Cepak
Hours: 24 Hours
Baud Rates: V21. V22
Access: Mem/VA
BBS Software: Opus
Comments: FIDOnet (713/607)

System Name: Sorcim microS
Phone: (043) 69 3658
Sysop: John Caine
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23
Access: Reg
BBS Software: Opus
Comments: FIDOnet (711/405)

System Name: Sydney PC User Group RIBM
Phone: (02) 238 9034
Sysop: Geoff May
Hours: 24 Hours
Access: Reg/VA

System Name: Tandy ACCESS RIBM
Phone: (02) 625 8071
Hours: 24 Hours
Access: Reg/VA

System Name: Tesseract RCPM
Phone: (02) 651 1404
Sysop: John Hastwell-Batten
Hours: 24 Hours
Access: Reg/VA

System Name: Texas Instruments (TISHUG)
Phone: (02) 560 0926
Sysop: Shane Anderson
Hours: `M-F 1900-0700 we24h
Access: Reg/VA

System Name: The Eagle's Nest BBS
Phone: (02) 451 0535
Sysop: Philip Dean
Hours: 24 Hours
Baud Rates: 300 Baud
Access:$10 pa Mem/$5 joining fee
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: Eagle-Board V2.2

System Name: Tomorrow Land's DIRECT
Phone: (02) 411 2053
Sysop: John Thwaite
Hours: 24 Hours
Access: Reg/VA

System Name: The Guild FRP BBS
Phone: (047) 21 8625
Sysop: Stafford Hewitt
Hours: 2100 - 0800 Daily
Baud Rates: V21
Access: Mem.VA

System Name: Twilight Zone BBS
Phone: (046) 25 0309
Sysop: Peter Hewett
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: Xmodem
BBS Software: COMboard

System Name: Upper-Hunter KBBS
Phone: (049) 73 3989
Sysop: Andrew Pike
Hours: 8am-8pm M/F 24hrsSun
Baud Rates: 300/450 Baud
Access: Free
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: Your Computer
Phone: (02) 669 1385
Sysop: Andy Farkas
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23
Access: Mem/VA
BBS Software: Opus
Comments: FIDOnet (712/622)

System Name: Zaenith BBS
Phone: (02) 477 7509
Sysop: Tony Callahan
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore

BBS Listing

Transfers: Punter
BBS Software: Punter BBS V64.4
Comments:

System Name: Zeta RTRS
Phone: (02) 627 4177
Sysop: Nick Andrew
Hours: 24 Hours
Baud Rates: V21. V22. V22bis.V23
Access: Mem/VA
Comments: B103. B212

A.C.T.

System Name: ACT Amiga BBS (Line 1)
Phone: (062) 59 1137
Sysop: Mike Hurst-Meyers
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23
Access: Reg.LVA
Machines: Commodore PC 40
BBS Software: Opus
Comments: FIDOnet (626/218)

System Name: ACT Amiga BBS (Line 2)
Phone: (062) 59 1440
Sysop: Mike Hurst Meyers
Hours: 24 Hours
Baud Rates: V22. V22bis.B103.B212
Access: Reg.LVA
Machines: Commodore PC 40
BBS Software: Opus
Comments: FIDOnet (626/219)

System Name: Canberra IBBS
Phone: (062) 58 1406
Hours: 24 Hours EST

System Name: Canberra RBBS
Phone: (062) 88 8318
Hours: 24 Hours EST

System Name: Canberra User Group
Phone: (062) 54-7365
Sysop: James Hacker
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: Punter
BBS Software: Punter BBS V64.4

Victoria

System Name: 10 - 1 Amiga Net
Phone: (03) 762 8193
Sysop: Mike Becket
Hours: 24 Hours
Access: Semi-open
Machines: Amiga
Comments: Commodore Area/File Area Messages Up/Downloading

System Name: ABE
Phone: (03) 288 3599
Sysop: Richard Gardiner
Hours: 24 Hours
Access: Reg. Fee$30
Machines: RBBS-PC
Comments: Up/Downloading, Messages, & Chat

System Name: AM-NET
Phone: (03) 366 7055
Sysop: Peter Hallgarten
Hours: 24 Hours
Access: $5 MEMBERSHIP
Machines: CP/M TURBO
Comments: Multi-use Ham Radio

System Name: AmigaLink
Phone: (03) 792 3918
Sysop: Bohdan Ferens
Hours: 24 Hours
Baud Rates: V21. V22. V23
Comments: FIDOnet (631/324)

System Name: aNDLER'S dEN
Phone: (03) 876 4118
Sysop: Greg Naylor
Hours: 0900-2300M/F 24hrw/e
Baud Rates: V21. V22. V23
BBS Software: Opus

System Name: Apple Hackers United
Phone: (03) 762 1582
Sysop: John Forbes
Hours: 24 Hours
Access: Restricted
Machines: Apple
Comments: Messages

System Name: Atlantis
Phone: (03) 277 6824
Sysop: John Edwards
Hours: 24 Hours
Access: OPEN
Machines: RBBS-PC
System Name: AUSOM
Phone: (03) 877 1990
Sysop: Grahame Willis
Hours: 24 Hours
Access: Open 7 Club Members
Comments: Messages Up/Downloading (Members Only)

System Name: Basic Users Group of Melb (BUGM) RCPM
Phone: (03) 500 0562

System Name: Big Tedd's Fido BBS
Phone: (03) 527 4945
Sysop: Big Tedd
Hours: 2100 - 0800 Daily
Baud Rates: V21
BBS Software: Fido

System Name: Brainstorm BBS
Phone: (03) 758 7086
Sysop: Rowan Stevens
Hours: 24 Hours
Baud Rates: V22
Comments: FIDOnet (631/322)

System Name: C-64 BBS
Phone: (03) 489 4557
Hours: 24 Hours
Access: $20 PER 6 MONTHS
Machines: CP/M SYSTEM
Comments: Messages Up/Downloading Chat

System Name: C-64 BBS (VIC)
Phone: (03) 489 4557
Sysop: Alan Miles
Hours: 24 Hours
Baud Rates: 300 BAud
Access: $20 per 6 months
Machines: Commodore
Transfers: YAM - Ward Christianson
BBS Software: Standard Ascii
Comments: Full Duplex

System Name: C-64 BBS (Vic.)
Phone: (03)489 4557
Sysop: Alan Miles
Hours: 24 Hours
Access: Mem
Machines: Commodore

System Name: Compusoft BBS
Phone: (03) 386 6019
Sysop: George Tsoukas
Hours: 24 Hours
Baud Rates: V22
BBS Software: Opus

System Name: Computer-Cations
Phone: (03) 482-1271
Sysop: Joshua Duffy
Hours: 24 Hours
Baud Rates: 300/450 Baud
Access: Free
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: Computers Galore BBS
Phone: (03) 561 8479
Hours: 24 Hours EST

System Name: Custom Programming OPUS
Phone: (03) 848 3331
Sysop: Allan Williamson
Hours: 24 Hours
V21.V22.V23.B103.B212
Access: Mem/Va
Machines: PC Clone
BBS Software: Opus
Comments: FIDOnet (630/303)

System Name: CYCOM
Phone: (03) 727 1018
Sysop: Darren Haysom
Hours: 24 Hours
Access: Semi-Open
Machines: FIDO

System Name: DECUS
Phone: (03) 63 9133
Sysop: Jay Ondracek
Hours: 24 Hours
Access: Limited Public
Machines: FIDO
Comments: Full access to DEC users

System Name: Down Under Software Amiga/IBM
Phone: (03) 429 8079
Sysop: Greg Hudson
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23
Access: Public
Machines: Compaw 386
BBS Software: Opus
Comments: Additional line (03) 429 5819 FIDOnet(630/306)

System Name: East Ringwood RCPM
Phone: (03) 870 4623
Hours: 1600-000EST Weekdays

System Name: EASTCOM FIDO
Phone: (03) 288 0775
Sysop: Maurie Halkier
Hours: 24 Hours
Access: Semi-Open
Machines: FIDO

System Name: Eastwood R/ZSYS & PBBS
Phone: (03) 870 4623
Sysop: Mick Stock
Hours: V21 - 0000 - 1000

BBS Listing

Baud Rates: V21. V22. V23
Access: Mem/VA
BBS Software: ZCPR3
Comments: FIDOnet (630/314)

System Name: Eastwood RCPM
Phone: (03) 870 4623
Sysop: Mick Stock
Hours: 24 Hours
Access: REG. $10
Machines: CP/M - OS9
Comments: SIGM & other groups vols.

System Name: Electronic Crossover
Phone: (03) 367 5816
Sysop: Stephen Paddon
Hours: `24 Hours
Access: SEMI-OPEN
Machines: FIDO

System Name: ENGBASE CBCS
Phone: (03) 29 6336
Sysop: Greg Furlong
Hours: 24 Hours
Baud Rates: V21. V22
BBS Software: Opus

System Name: Fortress
Phone: (03) 589 1692
Sysop: The King
Hours: 24 Hours
Access:Open Adventure atmosphere
Machines: Custom Software

System Name: Gippsland RCPM
Phone: (051) 799 2001
Hours: 24 Hours EST

System Name: Harboard- 64
Phone: (03) 587 2504
Sysop: Dave J. Harbour
Access: $10 REG.
Machines: C64
Comments: Logon with 2nd Carrier

System Name: Hisoft BBS
Phone: (03) 799 2001
Hours: 24 Hours EST

System Name: Inner Sanctum
Phone: (03) 233 8346
Sysop: Robert Swaab
Hours: 24 Hours
Access: Semi-Open
Machines: Opus Online Games
Comments: Adventure orientated

System Name: Macboard BBS
Phone: (03) 435 9152
Sysop: AUSOM Inc.
Hours: 24 Hours
Access: Open
Machines: Macintosh

System Name: Magic Pudding
Phone: (03) 428 2178
Sysop: Rupert Russell
Hours: 24 Hours
Access: Open
Machines: Opus

System Name: Mail-Bus
Phone: (051) 27 7245
Hours: 24 Hours EST

System Name: Maxitel BBS
Phone: (03) 882 6188
Sysop: Mark Micallef
Hours: 24 Hours
Baud Rates: V21
Access: Public

System Name: Melbourne Data Exchange
Phone: (03) 561 6556
Sysop: Robert Broomhead
Hours: 24 Hours
Baud Rates: V21 V22
Access: Reg/VA
Comments: FIDOnet (631/321)

System Name: Melbourne Micro Computer Club CBBS
Phone: (03) 762 5088
Hours: 24 Hours EST

System Name: Melbourne Microbee User Group RCPM
Phone: (03) 873 5734
Hours: 24 Hours EST

System Name: MICOM CBBS
Phone: (03) 762 5088
Sysop: Peter Jetson
Hours: 24 Hours
Access: Limited Visitors
Comments: MICOM Members Full Access Messages Only

System Name: Microbee RCPM
Phone: (03) 82 1571
Sysop: Mike Thompson
Hours: 24 Hours
Access: Limited Visitors
Machines: Microbee
Comments: Magazine name "Catcher"

System Name: Microlink
Phone: (03) 233 0230
Sysop: Micro-Drunks
Hours: 24 Hours
Access: OPEN
Machines: TRS-80
Comments: WARNING Reported Hacking Custom Software

System Name: Midnight Frog
Phone: (03) 569 1589
Sysop: Scott Enwright
Hours: 24 Hours
Access: Semi-Open
Machines: FIDO
Comments: Games

System Name: Mikes Bullboard
Phone: (03) 459 6439
Sysop: Mike Lewis
Hours: 1800-0900 weekdays
Access: SEMI-OPEN
Comments: Games

System Name: Motel International
Phone: (03) 509 9611
Sysop: Kim Graton
Hours: 24 Hours
Access: Semi-Open
Machines: PBBS
Comments: Mail to Node in U.S.A.!!!

System Name: Mini-Net BBS
Phone: (054) 41 3013
Sysop: Mel Fields
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: Xmodem
BBS Software: COMboard

System Name: National
Phone: (03) 25 6904
Sysop: John Blackett-Smith
Hours: 0600-1900/1930-0400
Access: Semi-open FIDO Network
Machines: OPUS

System Name: Omen IV RTRS
Phone: (03) 846 4034
Hours: 24 Hours EST
Comments: Off Line

System Name: Outer Limits
Phone: (03) 725 6650
Sysop: Captain Kirk
Hours:1700-0600M-F 24Hr W/E
Access: Open Science Fiction
Machines: FIDO
System Name: Pacific Island
Phone: (03) 890 2174
Sysop: Craig Bowen
Hours: 24 Hours
Access: Open
Machines: GBBS/APPLE
Comments: Special Commodore Areas Highly Recommended

System Name: PC Connection BBS
Phone: (03) 528 3750
Hours: 2100-1800WD/24HEstWE

System Name: PC Connection IBBS
Phone: (03) 528 3750
Sysop: Lloyd Barrett
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23

System Name: PC DOMAIN
Phone: (03) 789 8918
Sysop: Daryl Clayton
Hours: 24 Hours
Access: Semi-open
Machines: FIDO
Comments: $10 Donation requested

System Name: PC-Connection
Phone: (03) 528 3750
Sysop: LLoyd Borrett
Hours: 24 Hours
Access: REG
Machines: IBBS

System Name: PC-Oasis System
Phone: (03) 465 5357
Sysop: Craig Wilson

System Name: Poverty
Phone: (03) 309 0192
Hours: 24 Hours
Access: Semi-open
Machines: BBS - Amiga

System Name: Prodergy
Phone: (03) 562 0489
Sysop: Michael White
Hours: 1500 - 2030 Mon-Fri
Baud Rates: V21. V22. V22bis. V23
BBS Software: Opus

System Name: Profit
Phone: (03) 529 8749
Sysop: Andrew Hooper
Hours: 24 Hours
Access: Open
Machines: FIDO
Comments: Very slow Modem at 300bps

BBS Listing

System Name: S.C.U.A.
Phone: (03) 754 5081
Sysop: David Woodberry
Hours: 24 Hours
Access: Memb. TO SCUA
Machines: ROS
Comments: Most User Groups Vols.

System Name: Sams Board
Phone: (03) 563 1117
Hours: 24 Hours
Access: Semi-open
Machines: OPUS
Comments: International Fido-net

System Name: Sorcerer & CPM Users RBBS
Phone: (03) 754 5081
Sysop: David Woodberry
Hours: 24 Hours
Baud Rates: V21. V22. V23
Access: Mem/Reg/VA
Machines: Executive 816
BBS Software: Ros

System Name: Sorcerer Computer Users ASSOC. CBBS
Phone: (03) 434 3529
Hours: 24 Hours EST

System Name: Southern Cross
Phone: (03) 690 7220
Sysop: D. Harvey et al
Hours: 24 Hours
Access: Open
Machines: GBBS
Comments: Formally Public Resource II

System Name: Tardis RCPM
Phone: (03) 67 7760
Sysop: Malcome Miles
Hours:1800-0800M-F 24hr W/E
Access: Open
Machines: RCPM
Comments: All User Groups Vols

System Name: Telegraph Road
Phone: (03) 743 6173
Sysop: Kit
Hours: 24 Hours
Access: Semi-open
Machines: PBBS/Apple
Comments: Sister Board to Motel International

System Name: The Macboard
Phone: (03) 435 9152
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23
Access: Public

System Name: The National CBCS
Phone: (03) 25 6904
Sysop: John Blackett-Smith
Hours: 24 Hours
Access: Public
Comments: FIDOnet (630/301) Region 50 Co-ordinator

System Name: The Real Connection
Phone: (03) 288 0331
Sysop: Carla Miller
Hours: 24 Hours
Access: Public
Machines: FIDO
Comments: Special Commodore area incl. files/messages

System Name: Tommorrowland RBBS
Phone: (03) 523 6981
Sysop: David Laloum
Hours: 1700 - 2100
Access: Semi-open
Machines: RBBS
Comments: Unreliable Operation

System Name: Video Connection
Phone: (03) 754 4203
Sysop: Robert Kroes
Hours: 24 Hours

System Name: VideoTex4000
Phone: (03) 741 3295
Hours: 0700 - 2300 Mon-Fri
Access: Semi-open
Machines: VideoTex
Comments: Hours - 100 - 2300 Sat. & Sun.

System Name: Yarra Valley BBS
Phone: (059)64-3126
Sysop: Frank Connor
Hours: 24 Hours
Baud Rates: 300/450 Baud
Access: Free
Machines: Commodore
Transfers: Punter/Xmodem
BBS Software: KBBS

System Name: Zoist - RBBS
Phone: (03) 467 2871
Sysop: Bob Fletcher
Hours: 24 Hours
Access: Open
Machines: RBBS-PC
Comments: Special Commodore & File Area, highly recommended

Queensland

System Name: ACEA Commodore BBS
Phone: (07) 341 0285
Hours: 24 Hours EST

System Name: AMPAK PBBS/ RCPM
Phone: (07) 263 7070
Sysop: Brian Wendt
Hours: 24 Hours
V21.V22.V22bis.V23.B103
Access: Mem/Reg
Machines: AMPRO
BBS Software: PBBS
Comments: 147.600Mhz VK4KJB-1(Radio)1200bps Amature Radio

System Name: BEX 11 RCDM
Phone: (07) 395 1809
Sysop: Rik Dalley
Comments: (19/COSMOS)

System Name: Brisbane Commodore User Group BBS
Phone: (07) 808 2125

System Name: Brisbane Experimental RCPM 11
Phone: (07) 395 1809
Hours: 24 Hours EST

System Name: Brisbane MicroBee User Group
Phone: (07) 366 4833
Sysop: Graham Scott
Hours: 24 Hours
Access: Mem/VA
Comments: User Works Node #2

System Name: Brisbane Microbee User Group RCPM
Phone: (07) 38 4833
Hours: 24 Hours EST

System Name: Cairns & District IBBS
Phone: (070) 51 3582
Hours: WD 1800-0800 24H WE

System Name: C.C.U.G.Q. BBS
Phone: (07) 808 2125
Sysop: Ray King
Hours: 24 Hours
Baud Rates: 300 Baud
Access:$10pa (must be mem. CCUG)
Machines: Commodore
Transfers: Xmodem
BBS Software: COMboard

System Name: Competron IBBS
Phone: (07) 52 9498
Hours: WD 1700-0800/WE24HES

System Name: Connect 64 BBS
Phone: (07) 393 5352
Sysop: Craig Upton
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: None as yet
BBS Software: Connect 64

System Name: Colour Computer Link
Phone: (075) 32 6340
Hours: 24 Hours EST

System Name: Educational RBBS
Phone: (07) 266 3369
Sysop: Andrew Waddell
Hours: 24 Hours
Baud Rates: V21. V22. V22bis. V23
Access: Mem/VA
Machines: IBM XT Clone
BBS Software: Mailbox
Comments: Userworks Node #4

System Name: Futex - C64 BBS
Phone: (07) 283-2034
Sysop: Paul Salanitri
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: None as yet
BBS Software: Futex Corp.NSI Netw

System Name: Hi-Tech CBBS
Phone: (07) 366 6872
Sysop: Clyde Smith-Stubbs
Hours: 24 Hours EST
Baud Rates: V21. V22. V23

System Name: Hotline BBS
Phone: (07) 353 3718
Sysop: Lionel Theunissian
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: None as yet
BBS Software: HEX

System Name: Red CentreRCPM
Phone: (075)32 6340
Hours: 24 Hours

System Name: Sidecare Express BBS
Phone: (075) 46 3252
Sysop: Brendan Pratt
Hours: 24 Hours

BBS Listing

Baud Rates: V21. V22.V22bis.V23
Access: Mem/Reg
Machines: Spectravideo
BBS Software: TurboBBS
Comments: User works node #7

System Name: Rock Cave BBS
Phone: (07) 395 1809
Sysop: Rick Dalley
Hours: 24 Hours
Access: Mem/Va
Comments: User Works Node #4

System Name: Software Tools RCPM
Phone: (07) 378 9530
Hours: 24 Hours EST
System Name: TI BUG BBS
Phone: (07) 263 6161
Hours: 9pm-6am Weekdays

System Name: Tomorrowland RMSD
Phone: (07) 394 2300
Sysop: Dave Drummond
Hours: 24 Hours
Baud Rates: V21. V22 V23

South Australia

System Name: Adelaide Micro User Group BBS
Phone: (08) 271 2043
Sysop: Richard Newcombe
Hours: 1000-2200CSTWe&Hols
Baud Rates: V21
Access: REG/LVA
Machines: TRS-80 Model III

System Name: Adelaide MicroBee BBS
Phone: (08) 212 6569
Sysop: Ron Carson
Hours: 24 Hours
Baud Rates: V21
Access: Reg/LVA
Machines: Microbee 128K

System Name: Cadzow Fido
Phone: (08) 79 3091
Sysop: Scott Cadzow
Hours: 24 Hours
Baud Rates: V.21 V23
Access: Public
Machines: Epson
BBS Software: Fido

System Name: Computer Ventures BBS
Phone: (08) 255 9146
Hours: 24 Hours CST

System Name: Electronic Oracle IBBS
Phone: (08) 260 6686
Hours: 24 Hours CST

System Name: Micro Accessories Bulletin Board Oasis 5
Phone: (08) 287 1280
Hours: 24 Hours
Machines: C64, Atari
Comments: $25per year,download software.

System Name: Multiple BBS(Multi-BBS)
Phone: (08)255 5116
Hours: 24 Hours

System Name: Multiple System BBS
Phone: (08) 255 5116
Sysop: Danny Vozzo
Hours: 24 Hours
Baud Rates: V21
Access: Reg/LVA
Machines: Apple //+
BBS Software: GBBS

System Name: Nexus Education Dept BBS
Phone: (08)243 2477
Hours: 24 Hours
Baud Rates: V21
Access: MEM

System Name: Omen V
Phone: (08) 356 7939
Sysop: Richard Siggs
Hours: 24 Hours
Baud Rates: V21
Access: Public
Machines: System80

System Name: Omen V RTRS
Phone: (08)243 2477
Hours: 1800-0700 Daily

System Name: SA Commodore BBS
Phone: (08)371 0435
Sysop: Peter Hinton
Hours: 24 Hours
Baud Rates: 300 Baud
Access: Free
Machines: Commodore
Transfers: Xmodem
BBS Software: COMboard
Comments: OFFLINE

System Name: The IDN Board
Phone: (08) 352 2252
Sysop: Dave Winfield
Hours: 1730-0900M/F 24hr we
Baud Rates: V21. V22
Access: Reg/LVA

System Name: The Olympic Board
Phone: (08) 265 4232
Sysop: Greg Sanderson
Hours: 24 Hours
Access: Public
Machines: XT Clone
BBS Software: Opus
Comments: FIDOnet(680/801)

Western Australia

System Name: Mouse Exchange BBS
Phone: (09) 339 6890
Sysop: Leonard Hollings
Hours: 24 Hours
Baud Rates: V21. V23
Access: Public
Comments: FIDOnet (690/902)

System Name: Nemo 3
Phone: (09) 370 3333
Sysop: Graeme Platt
Hours: 24 Hours
Baud Rates: V21. V22 V22bis V23
Access: Mem

System Name: Nemo Games Machine
Phone: (09) 370 2666
Sysop: Graeme Platt
Hours: 24 Hours
Baud Rates: V21 V22 V22bis V23
Access: Mem/LVA

System Name: Nemo Multiple BBS RAPL
Phone: (09) 370 1855
Sysop: Graeme Platt
Hours: 24 Hours
Baud Rates: v21 v22 v22BIS v23

System Name: Oasis BBS
Phone: (09)383 1480
Sysop: Computer Oasis
Hours: 24 Hours
Access: Vis/Mem
System Name: Omen II RTRS
Phone: (09)279 8555
Hours: 24Hours

System Name: Omen Mini BBS
Phone: (09) 279 8555
Sysop: Greg Watkins

System Name: Pegasus BBS
Phone: (09) 242 1515
Sysop: Michael Russell
Hours: 1700-0900M/F 25hrW/E
Baud Rates: V21 V22 V22bis V23
Access: Public
Machines: Epson AX
BBS Software: Opus

System Name: Perth RMPM
Phone: (09)367 6068
Hours: 24 Hours

System Name: Pilbara's First BBS
Phone: (091) 732 275
Sysop: Wayne Wessling
Hours: 24 Hours
Access: Public
Machines: All

System Name: WA Atari BBS
Phone: (09) 306 2134
Sysop: Graham Basden
Hours: 24 Hours
Baud Rates: V22
Access: Reg/LVA

N.T.

System Name: Omen II RTRS
Phone: (089)27 4454
Hours: 24Hours

System Name: Outback RCPM
Phone: (089)27 7111
Sysop: Phil Simpson
Hours: 24Hours
Baud Rates: V21. V23
Access: Public
Machines: Bigboard II
BBS Software: Minirbbs

Tasmania

System Name: MS-RBBS TRRS
Phone: (003) 34 0911
Sysop: Mike Scott
Hours: 24 Hours

System Name: Tassie Bread Board System
Phone: (003) 26 4248
Sysop: Ian Campbell
Hours: 24 Hours
Baud Rates: V21. V22 V22bis V23
Access: Mem/LVA
Machines: Kaypro PC
BBS Software: TBBS

Dealers

DEALER: The person or shop where you will find computer equipment, peripherals, software, books, *Australian Commodore and Amiga Review* and other magazines, expert help and friendly advice.

ABLE PRODUCTS OF AUSTRALIA
P.O. Box 215
Gladesville, NSW 2111
Ph: (02) 816 3700

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11A Waverley St
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6 High Street
Cranbourne, Vic 3977
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116 Cambridge St
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202 Alison Road
Randwick, NSW 2031
Phone: (02) 399 8865

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Tower Square, 155 Miller St
North Sydney, NSW 2060
Phone (02) 957 4690

COMPUTERSCOPE
cnr Patrick St & Kildare Rd
2/9 Patrick St
Blacktown, NSW 2148
Phone: 831 1718

COMPUTER VIEW
21 Brisbane Road
Bundamba, Qld 4304
Phone: (07) 282 6233

DAY ELECTRONICS
Rear 121 Doveton Street N.
Ballarat, Vic 3350
Phone: (053) 315511

HIGH TECHNOLOGY
290 Bay St
Brighton, Vic 3186
Phone: (03) 596 6211

MAXWELL The Commodore Centre
162 Nicholson St
Abbotsford, Vic 3067
Phone (03) 419 6811

MICROCOMPUTER SPOT
Shop 3, 99 Elizabeth Street
Sydney, NSW 2000
Phone: (02) 221 1910

MICROCOMPUTER SPOT
185 Burwood Road
Burwood, NSW 2134
Phone: (02) 744 8809

MICROCOMPUTER SPOT
Shop 21a, Greenway Arcade
222 Church Street
Parramatta, NSW 2150

PARIS RADIO ELECTRONICS
161 Bunnerong Road
Kingsford, NSW 2032
Phone: (02) 344 9111

SCARBOROUGH FAIR COMPUTER CENTRE
Scarborough Fair Shopping World
Southport, Qld 4215
Phone: (075) 325 133

SO-LO VIDEO
Shops 1, 2 & 3 Roberts Road
Hackham West, SA 5163
Phone: (08) 382 5740

SPACELAND COMPUTER CENTRE
Spaceland Arcade
John Street, Salisbury, 5108
Phone: 250 6077

SYDNEY UNITED COMPUTERS
207 Clarence St
Sydney, NSW 2000
Phone (02) 29 5088

SYDNEY UNITED COMPUTERS
665 Pittwater Road
Dee Why, NSW 2099
Phone: (02) 981 4455

TEL - AIR ELECTRONICS
(Gold Coast)
COMMODORE SPECIALISTS
90 Scarborough Street,
Southport, Qld 4215

UNITED COMPUTERS
991 Stanley St
East Brisbane, Qld 4169
Phone (07) 393 0300

WESTEND COMPUTERS
402 Bell St,
Pascoe Vale South,
Vic 3044
Phone: (03) 350 5144

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Disk Drives

Small, fast, fat or thin. Different colours, speeds and capacities. Some compatible, some not so compatible. Which model will do the job you need, and where can you get some of those rarer models?

There are two main breeds available, serial and IEEE. The latter was designed for Commodore's older range of CBM machines. However, using an interface it is possible to operate an IEEE disk drive via the usual serial port. Bulletin boards commonly operate on these drives due to the large capacity. Program developers also find them useful for the same reason. With some variation, there are roughly six drives which fit the IEEE category. These all have obscure names and vary primarily in capacity and number of drives per unit.

Hard disks

Two hard disks are available. These have been copied in various forms by third party suppliers, and we may begin to see more of these readily available in Australia soon.

Imagine almost 8 Megabytes of storage and you have a top of the line D9090. At under $500, you can't go far wrong if you're considering a setup that requires high-speed mass storage. Higher capacity is available for a whole lot more bucks. In fact a total of $1850 will buy you a 10 Megabyte ST10C, Miniscribe drive with Commodore interface. Both the D9090 and the ST10C can be purchased through Graham Lee.

The man who pioneered bulletin board systems in Australia is now not only selling the software to run them, but the hardware as well! Catch Graham during the day on (02)665 0111 - and don't forget to mention where you saw his number.

Dual drives

In our next category are the IEEE dual drives, which are still around in good number. The 8250 and 8050 are very similar. The former boasts just over 1Megabyte per drive, whilst the other is just on the 520K mark. Both require double sided double density disks to operate reliably. These are a little more expensive than usual.

Once again, an ideal way to set up a BBS system that may have several disks full of software for downloads. These can be mounted or removed from the floppy drives, whilst a hard disk does the job of keeping track of members and messages.

The DOS format of all the 8250 and 8050 is NOT compatible with the 1541. However, the dual drive 4040 and single drive 2031 are close enough to be able to read and write 1541 format disks 99% of the time. These are often used for disk software production.

Some IEEE interfaces support DOS 4.0. This means you can use simple commands to copy or format disks. Alternatively, why not purchase an old PET, and like I do, use it for achieving or just a spare computer to view disk directories.

Single Serial drives

Now to the more familiar names such as the 1540, 1541, 1570 and 1571. One not so familiar might be the 1561. This miniature drive, is a 3 1/2 inch version of the 1541. It was never released in Australia, and you can't buy one anywhere that I know of. It was slightly faster, and more reliable than its big brother, but never made the big time.

Vic 20 owners may remember the 1540. Originally in a creamy colour, it was the first single drive that followed the new sleeker styling of Commodore's consumer range. The sleeker lines I refer to are those which followed the demise of the boxy PET range.

The primary difference between the 1540 and the 1541 is that of speed. Although the 1541 will work with a Vic 20 the 1540 will not work with a Commodore 64 unless you issue a special command. All of this is of course irrelevant since the 1540 is no longer available.

Its successor operates at around 300 CPS, which is slow by any standard. Since its release there have followed a swag of speed-up devices ranging from plug-in cartridges to complete ROM changes and cable variations.

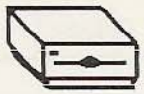
As an interim step to supporting the newly released C128, Commodore provided the 1570. Much higher data transfer rates are supported, however only single sided formats may be read. The 1571 solved this problem, providing a drive which is reasonably compatible with the 1541 whilst being able to handle a host of new formats.

Conclusions

Purchasing a disk drive is a very important step to upgrading your system. You'll never go back to using cassette, and your software collection will probably grow at an alarmingly faster rate.

For serious use, some of the older drives offer excellent levels of reliability whilst greatly increasing storage space. Beware that IEEE cartridges inevitably destroy some compatibility, however in certain applications that is no consideration. You can find second hand drives in the classified advertisements of newspapers.

Personally, I would never do without my trusty 1541. However, the old 4040 is invaluable for backing up disks using our equally old CBM 4032. Many Bulletin Boards are operated successfully using an 8250 or the more recent 1001 drive, which is basically a single drive version of its predecessor.



Disk Drive Comparison Chart

Model	S/D	Capacity	Speed	Compatibility	Retail
1540	S	170K	40/0.4	VIC 20	S/Hnd $100 - $150
1541	S	170K	40/0.4	C64	RR $399
1541C	S	170K	40/0.4	C64(90%)	RR $399 !!
1560	S	170K	unknown	not released	n/a
1570	S	170K	40\0.4	C64 80%, C128 (90%)	S/Hnd $200 - $250
1571	S	VARIOUS	various	C128, C64 (80%)	RR $529
2031	S	170K	40Kb/1.8	CBM, C64 with interface	S/Hnd $100
4040	D	340K	40Kb/1.8	CBM, C64 with interface	S/Hnd $400 - $500
8250	D	2.12MB	40Kb/1.8	CBM, C64 with interface	S/Hnd $800 - $900
8050	D	1.05MB	40Kb/1.8	CBM, C64 with interface	S/Hnd $600 - $700
1001	S	1.05MB	40Kb/1.8	CBM, C64 with interface	S/Hnd $400 - $500
D9060	H	4.98MB	5Mb/1.8	CBM, C64 with interface	S/Hnd $500 - $600
D9090	H	7.47MB	5Mb/1.8	CBM, C64 with interface	S/Hnd $500 - $600

Disk Drives Glossary

BAM : Block Availability Map. A special area of the disk containing a map to available free and used space.

Channel: Identifier for operations to take place on a specific task. Allows several files to be open at one time, with varying operations.

Directory: A list of the files, their length, location and type on a specific disk. The directory may be viewed in part using the LOAD "$",8 command. Type LIST to view the entries.

DOS: Disk Operating System. A program which runs inside the disk drive and controls the operation of all disk activity.

Format: To arrange or prepare a disk ready to store information. Different brands of computer use different formats. A blank disk is similar to a new car park with no lines marked in which vehicles may be parked. Formatting the disks divides the disk into petitions ready for information just as marking our a new car park prepares car parking places.

File: Information related to one subject or a program containing a set of instructions for the computer. There are various file types. Programs, Sequential, Relative and User. Deleted files remain on the disk, only the file type is changed.

Hub: The central circle about which the disk spins.

Initialize: Reads information about the disks identity.

New: Formats a disk.

Random Access: Any part of a disk may be accessed instantly. There is no need to read preceding information to reach a specific point on the disk. This means information is read and written faster than sequential access.

Read Error: Occasionally disks become damaged through misuse, old-age, accidents and mishaps. Heat, humidity and dust can also cause the same result. A read error!

Relative: (files) A file broken into records, all exactly the same size and accessible by the record numbers, is called a relative file. Databases, and simple filing system make use of this format.

Rename: The name attributed to a file and stored in the disk directory may be renamed.

Scratch: Unwanted files may be scratched or erased. The BAM is updated, freeing up additional disk space, and the directory entry is modified.

Sector: Each track is divided into 17 to 21 sectors, depending on where about on the disk it is located. Tracks towards the outside of the disk have more sectors than tracks toward the inside of the disk.

Sequential: A file stored where each entry immediately follows the next. To read the last entry, all those preceding it must also be read. Tis method is usually used for wordprocessor documents.

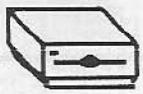
Serial: Information is sent to and from the computer via the disk drives serial port. Here, each character is divided into eight bits and sent one bit at a time. This method is much slower than parallel transmission of data.

Track: Similar to a music record, the disk is divided into 35 tracks. Each track forms a complete circle, rather than spiralling toward the centre. Each track is divided into several sectors.

Validate: A cleanup process where any blocks on the disk allocated in the BAM but not actually used, are de-allocated. Files that weren't closed properly are erased.

Verify: Check that a file was written to the disk correctly.

Write-Protect: A small tab at the top left hand side of the disk controls whether the disk can be written to or not. When the tab is covered no information can be written to the disk, protecting any information from accidental erasure.



Speeding up your disk drive

Dolphin DOS

Dolphin DOS is reputedly still the fastest disk operating system available for the Commodore 64.

Dolphin DOS has taken the Commodore 64 and once sluggish disk drive out of the bracket of slow drive running into the world of real quick, very fast and amazingly agile.

When you are so attuned to the 1541's slowness, Dolphin DOS is certainly a pleasant surprise. The speed up is produced by use of a parallel cable between the 64's user port and a piggy back board inside the 1541.

The effect can be likened to the difference between several thousand people trying to get into the Royal Easter Show through one turnstyle, and the increased flow produced by opening an additional seven gates. Dolphin DOS is your additional seven gates - giving a total of eight paths for information to pass between the disk drive and computer.

Normally information is sent one bit at a time. Every character you see on the screen needs eight bits to tell the computer exactly which character it is. These eight bits together are called a byte. Using a parallel cable we can send one whole byte at a time rather than just one bit. Theoretically this should result in an instant speed up by a factor of eight. However, Dolphin DOS also puts into use a variety of other methods used to increase disk access time.

Installation

The package is not to be connected up by the faint hearted. If you fret at the sight of bared circuit boards, flinch at the sound of an IC being pulled gently from its socket - then please do not read these next few paragraphs.

Start by opening the lids of your Commodore 64 and 1541 - you're going to be doing some major heart surgery on both - don your surgical mask and take a long flat blunt instrument in your right hand. Carefully lever out the Kernel ROM in your 64 - I used a butter knife, not recommended, but always readily available.

Next remove the 6502 and 6522 chips from your 1541 - connect the heart bypass machine and check the pulse and heart rate - only continue when they've stabilised (yours, not the computer's). Now carefully insert the various replacement boards/ROMS, additional cables, switches and the like. Now replace the 6502 and 6522 IC's into the respective sockets on the piggy back board.

Connection on the 128 is a little more complex due to the additional shielding and casing that tends to make the device rather awkward to fit without some form of nibbling tool.

Operation

Dolphin DOS doesn't just speed matters up and leave it at that. You now have additional commands via the function keys and keyboard that will make disk access commands such as OPEN 15,8,15 a thing of the past.

Shift-RUN STOP will load and run the first program in the disk, and you no longer need to include a device number at the end of a LOAD or SAVE command - thus LOAD "program" will suffice rather than the clumsy LOAD "program",8.

Verification is also faster.

Conclusions

Dolphin DOS is an excellent product reflecting the state of the art when it comes to improving your 1541 drive.

Good documentation and consistent operation over the past months have led to our confidently recommending it to many people.

Dolphin DOS is distributed by Micro-Accessories and sells for a recommended retail price of $169.00.

Cockroach Turbo Rom

The Turbo Rom is a 16K chip which is installed in the computer replacing the 8K Kernel/Basic chip. However only 8K is ever used at once. The 16K is split into two 8K Blocks - 8K for the standard Kernal/Basic Rom and another 8K for the revised Turbo Rom Kernel/Basic. A switch is fitted to the Rom to allow for the switching between the two banks. The revised 8K Kernel / Basic does not include code necessary for use of the Cassette port or the User port; the existing code was replaced by some more useful code for the disk user and to provide room for the Turbo routines.

Installation can be either a simple matter or a job for a qualified technician. If your chips are soldered in rather than socketed, then a professional is required to de-solder the existing chip and replace it with the Turbo Rom (this is the case for about 20% of all 64's). If you are lucky enough to have socketed chips then you can have your Rom installed in minutes. Installation also requires drilling a small hole in the computer's casing for the switch. The instructions for installation are very precise and also include diagrams, making installation for the non-soldered chips very easy.

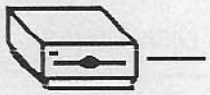
The Turbo Rom also includes a few other very handy features, such as in-built Dos Wedge, and a few extra commands such as Zap, Old and Mon.

The disk directory is obtained by simply typing '@$' rather than 'LOAD"$",8:LIST'.

The Turbo Rom not only increases the speed of Loading, but saving and verifying as well.

The Turbo Rom is compatible with most Commodore drives, i.e. 1541, 1570 and 1571. However the fast format does not work on the 1570/71.

The only drawback of the Rom is the fact that it must be disabled for use with the User Port for modem communications.



How to talk to your disk drive

The little box that you feed diskettes is very intelligent, and can be used very effectively with a little understanding. Just as your computer is fitted with an operating system that allows you to use Basic words for programs, so too disk drives have their own operating system. This system is most commonly named the Disk Operating System (DOS) but I think that Disk Basic is a more readily understood concept. Before going any further, however, let's find out what a diskette is.

The diskettes used in most computer disk drives are sheets of a plastic-type material, with coated surfaces that are designed for magnetic recording. Each disk is about 130 mm diameter, with a 30 mm hole in the centre. Both sides of the disk are coated, and factory quality control decides whether one or both sides come up to quality standards, labelling the results as single or double sided disks.

The actual disk is housed in a sleeve or envelope, usually lined with a wiper-type material that collects the dirt and dust that accumulates on the disk itself. The envelope is about 165 mm square, with a long slot through which the recording head can access the disk. On one edge (the left side as you look at a disk as you insert it into the drive) is a "write protect" slot. If not covered, you can both read and write to the disk. If a tab is stuck over the notch, you can read but not write to the disk, thereby protecting disks from accidental writing or erasure. There are two small nicks along one edge, to act as stress relief. A final small hole near the central hole completes the envelope description. It is part of a detection system that is of no particular interest here.

In use, the diskette is written on the back - the side away from you when you are reading the label. The envelope, of course, stays still while a broad hub grips the diskette and spins it at about 300rpm (or its metric equivalent). New disks may be a bit stiff in their covers at first use, and could give a worry or two if you are unused to diskette use. More of that anon.

Disk organisation

Commodore 1540/1541 disk drives follow a convention that started with the very first drives they released. Each disk has 35 tracks, something like a phonograph record (or a laser disk, for those a bit younger!). You can't see the tracks, but they are there, all 35 of them, concentrically arranged. Another convention is how they are "named" - Track 1 is at the outer edge and Track 35 at the inner. That is how the first subdivision is arranged.

The next subdivision is carving up each track into more convenient bits, named sectors (or block - the names seem to be interchangeable). Each sector is designed to hold 256 bytes of information, so that four blocks are needed to hold 1K of information. Because the disk circumference is greater at the outer edge, there is room for more sectors in each track at the outer edge, decreasing as you come towards the centre. Commodore has taken advantage of this to pack a bit more storage onto their disks. Track 1 has 21 sectors (numbered 0-20) while Track 35 has only 17 (0-16). In all, there are 683 sectors on an empty disk. Nineteen of these are set aside for the directory track, so 664 remain for you to use. If you think about it for a minute, a sector is quite tiny - on Track 1, less than 19 mm long.

Choice of diskettes is a complex subject, and sometimes one of violent disagreement. Given the competitive environment in the market place, there are unlikely to be any really bad products out there. Some seem to be better than others, but it is virtually impossible for a casual user to work out some rating scheme. Price does not seem to be a guide.

The operating system in any Commodore single disk drive is about as complex as the operating system in the Commodore 64. There is about 16K of program permanently in each, which makes the disk drive a very powerful system indeed. But unless you know how to get to the system in the disk unit, you will never have much fun with your machine.

The commands provided for your use fall into two groups - those that are built into the C64 (which are mainly used for passing information back and forth between the computer and the disk drive) and those that are in the disk drive, and are often termed "housekeeping commands". The groups are like this:-

C64 COMMANDS:
CLOSE
GET#
INPUT#
LOAD
OPEN
PRINT#
SAVE
VERIFY

DISK DRIVE COMMANDS:
COPY
DUPLICATE
INITIALIZE
NEW (not to be confused with NEW)
RENAME
SCRATCH
VALIDATE

These commands will be explained as we go through the article.

The first thing you have to learn is how to talk to your disk drives. The trick is to think of disk access like a conversation that you and I might hold. We would greet each other, say what we want to say, then bid farewell. All the time, we would be watching each other - feedback from any conversation is a vital part of the intelligence loop that we all use. Disk use is rather like this, except that you need to stick with some rules of conversation.

The rules of polite conversation also apply to your disk drives. The salutation is all important To do this, you need to use the correct syntax. Commodore has provided the facility to set up conversation "lines" by opening channels to peripheral devices such as printers, disk units, cassettes and so on. You can have a number of lines open at one time, but the important line (or channel) with disk drives is what is termed the "error channel". Channel 15 has been set aside specifically as the error line, so to get the conversation going, we do this:-

OPEN X,8,15

What does this do? The Commodore

syntax is unique, and very easy to use. "X" is the file number of your choice, and can be any number 1-255, but for simplicity is usually 1-15. The device number assigned to disk drives by Commodore is 8, so we must mention this. The last parameter is the channel number to use. To send commands to the drive, we will use channel 15. You can type this command in direct mode (straight from the keyboard) or in a program. Remember it - you will doubtless have many occasions to use it.

The three parameters used here have official names. "X" is Logical File Number, "8" represents the Device Address, and "15" is termed the Secondary Address. All are important, but don't worry too much about them for now. I mentioned them here only to provide some sort of link with the terminology used in handbooks and magazine articles.

Having struck up a conversation, we now need to say something. What will we say? Let's put the disk drive read/write head over the directory track, ready for some action. The Disk Basic word that does this is built into the disk drive - "Initialize", and may be followed by the disk drive number if more than one is on the line. The keyword is a bit longwinded. Luckily the disk drive can figure out what to do from the first letter ("I" in this case), so we can send the command with a minimum of fuss. The conversational routine is to send the command by "printing" to the channel we have opened. PRINT#n is the syntax to use, so if we have opened file 7, we have:-

```
OPEN7,8,15    and now
PRINT#7,"10"
```

Notice that the command is in quotes, conversational-style. To finish off our conversation, we say goodbye with

```
CLOSE 15
```

That didn't hurt too much - but it didn't do an awful lot either, and will only work on a disk that has been formatted.

What's New?

When you take an unused diskette from its box, it needs some action on your part before it can be used. The action is termed "NEW", a particularly Commodore word. NEW (for disk use) simply means preparing a new diskette for use. Do not confuse disk NEW with computer NEW (to erase the current program in the memory.)

Most disks are made as total blanks - nothing more than a coated circle of plastic sealed in a cardboard sleeve. Before you can use it, it is necessary to carve up (metaphorically speaking) the physical surface of the disk into a pattern acceptable to the disk drive. The disk operating system (DOS) likes an orderly life, and requires an ordered disk to work with.

How do you order the disk - "NEW" it, to use the Disk Basic command? Just as before, it is necessary to strike up the conversation with:-

```
OPEN 15,8,15
```

Before going any further, you need to make a couple of decisions. What name do you want to give the disk, and what identification number is it to have? What's in a name and ID? OK, you may select any name up to 16 characters to give your disk some character. Give it a fun name, give it a serious name, but call it something. The ID is another part of the identity, so choose two characters. The very important rule here is - make every ID unique. Avoid using the same ID twice. Both the name and the ID should be alphanumeric characters.

Decisions, decisions. Right, let's push on. Suppose you decided on ADVENTURE as the disk name, and A2 as the ID. The next thing is to tell this to the drive with the PRINT# statement that we used before:-

```
PRINT#15,"NEW"
ADVENTURE,A2"
```

If you have more than one drive (lucky you), the number of the drive you want to use is popped in after the command (eg N1;DISKTITLE,ID).

What happens now? All being well, the disk drive will spring into action and get to work. The DOS moves the read/write head to the outer edge of the disk, and starts to format each sector on the disk. It performs a series of jobs. Among the jobs: the disk ID and some mysterious marks are written to a hidden part of each sector, then space for 256 bytes (one sector) is set aside. This is repeated for all 683 sectors on the disk. Finally, the directory track (Track 18, in the middle of the disk) is set up ready for use. Having done all that the disk is now ready for action. The conversation is concluded on the usual cheery note -

```
CLOSE 15
```

And you have completed your first voyage into disk housekeeping land.

The usual way of doing NEW is directly from the screen. The command is typed on one line (no line number, of course) like this -

```
OPEN
15,8,15:PRINT#15,"N:DI
SKNAME,ID";CLOSE 15
```

The command is also used whenever you decide that some in-use disk needs a fresh start. You can use the full command as given above, which will thoroughly erase every sector. Be warned about this! A short form command will erase only the directory.

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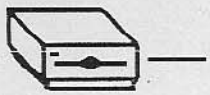


OPEN 15,8,15:PRINT#15,"N":DISKNAME":CLOSE 15

Notice that the ID is omitted in this syntax.

Going back for a minute to diskettes that have not been used before. My practice is to NEW each disk TWICE when I'm setting it up. Brand new diskettes have been jammed in their sleeves since manufacture, and packed tightly in boxes. They are subject to quite a bit of friction at first. I NEW disks twice to ensure that there is no doubt that the process is thorough. This is even more important with low-torque motored drives, which have to work quite hard with new disks.

To recap. We have found how to initialize a disk (PRINT#15,"1" or PRINT#15,"10"). We can also prepare a blank diskette for use, and wipe clean an in-use diskette. Ah, the power of it all.

Ever heard of the WEDGE program? Why wedge, anyway? It started with the ">" symbol . . . sometimes called the "wedge". To cut it short, WEDGE is a program that provides a way of shortening the conversation by doing the opening and closing chat for you. It may be a bit lacking socially, but it saves time. To illustrate its use -

>N:ADVENTURE,A2 performs NEW

No open, no close, no quote marks. WEDGE (sometimes named DOS SUPPORT) looks after that. We will discuss its use as we go further.

Be tidy

The next command is very easy to understand. Scratch is another singularly Commodore word, and its use is for erasing unwanted files from disk. Why Scratch and not Erase . . . well, what's your guess?

We started using WEDGE in my previous article, so let's stick with it. To take an unwanted file (PRG, SEQ, USR, REL) from any disk, it's a matter of -

>S:FILENAME

Be careful!!! Once the line is typed, and you press RETURN, there is no escape (except a hurried withdrawal of the disk from the drive). In another Basic, Commodore gave you an extra chance by asking "Are You Sure?" but somewhere along the way between 1979 (when Basic 4.0 was written) and 1983 (when the C64 was released) this simple safeguard was dropped.

It's time to introduce something named "don't care". The "*" character is used to tell the DOS to ignore any characters it finds beyond where you have put it. If you do something like -

>S:MASTER*

you tell DOS to erase all the files it finds in the directory with MASTER as the first six letters, no matter what follows them If you have MASTERFILE, MASTERLIST, and MASTERPRINT on your disk, this command will erase them all. Be even more careful with this syntax than before. You may lose something you meant to keep.

The other option is termed "wild card", using "?" as the wild card character. This is really an embedded "don't care", that can be used within a name. If you have three files named MASTER1.MOD, MASTER2.MOD and MASTER3.MOD, you could erase them in one swoop with -

>S:MASTER?.MOD

because DOS won't worry about the character that it finds in place of the "?". Again, CARE. Think before RETURN.

Scratch doesn't actually erase the program sector by sector from your disk. What it does is to alter a byte in the directory, so that DOS thinks the program is no longer active. It also alters its memory of free disk block space to reflect the fact that the sectors that were used for the Scratched program are now available for use. If you do accidentally Scratch a wanted file, don't write anything else to the disk, but grab a copy of one of the file recovery programs, which can be used to restore the altered directory byte. Follow the recovery program directions carefully.

Copy is the next Disk Basic command.Copy is not as useful in a single disk drive as in a dual drive, but there is one particularly useful implementation of it that you must know. First off, the core command -

>C0:NEWNAME=0:OLDNAME

will copy a file named OLDNAME on Drive 0 to a file named NEWNAME on Drive 0. File OLDNAME stays put without change. This can be useful for....well, you think about it. I use it when I want to keep a copy of some program that works but needs tidying up, so that I have a second copy of my hard work just in case.

The other use is for data file concatenation. That mouthful simply means sticking files together end to end, but it only works with SEQ files. Need big data files? Well, the syntax is -

>C0:TOTAL=0:PART1,0:PART2,0:PART3

Up to four files may be put together this way. However, the total command string (from " "to "3" in the example above) must not be more than 40 characters long, so lengthy data file names are not on if you want to amalgamate a whole parcel of sub-files. Caution suggests doing only two sub-files at a time, but the command is quite reliable so my caution may not be justified.

Duplicate is another housekeeping command that you may come across, but it will only work in dual drives. You cannot strap two 1541 drives together and use this command, because (although Commodore left the command pointer in the 1541) there is no working system to make it happen.

Before going on to the next topic, let's fill in one important use of the error channel. We spoke before of "conversational feedback", so if you have a bored look on your face right now, I can tell that you are losing interest. After each major disk use, it is possible to check that all went well by asking for some feedback. The usual syntax (after opening the error channel) is to ask for any error messages -

INPUT#14,EN,EM$,ET,ESPRINTEN,EM$,ET,ES

If EN (error number) is 0, everything is OK. If EN is greater than 1, then EM$

will tell you the error. ET (not that one!) and ES will tell you the number of the track and sector where the error happened. With WEDGE, the syntax is much easier. Just type ">" (without the quotes) and the error message string will be printed out for you.

Track 18

Rename lets you give a file a new name with little effort. Why do this? OK, you have a program named GRAPPLE on disk, but for reasons known only to yourself want to name it GZYT3$KPW20. By the look of that, let's leave it that way. With WEDGE, you would say -

>R:GZYT3$KPW20=GRAPPLE

With the new name being put in place ("=") of the old. This changes the bytes on the directory track where the name is stored.

Speaking of directories, the Validate command is next, so it's time to start looking at the mysteries of Track 18. We will ignore everything except Sector 0 for now. So, here comes BAM.

BAM stands for Block Allocation Map, This is not a map in the traditional sense, but a series of bytes that store information about which sectors are in use, and which are not. Every time you store something on disk, the BAM is rewritten to mark the fact that you have used some sectors. In the same way, when you Scratch a file, the BAM takes account of this.

Well, that's the theory, and it works most of the time. But every so often, things go awry and the BAM gets out of kilter. Add up the number of blocks used (the left hand column in a directory listing). Subtract the result from 664 (the number of blocks on a disk excluding 19 set aside for the directory track). This should be equal to the "blocks free" shown at the foot of each directory. If not, you need to validate the disk -

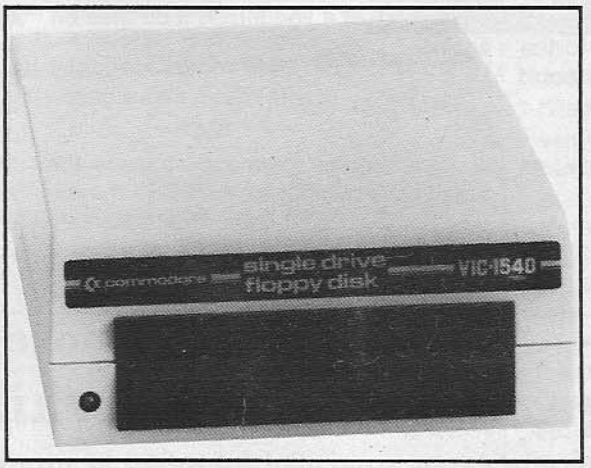
>V(or >V0 or >V1)

To my mind, this command is largely forgettable - except for one very important time. Read what follows carefully, as it could save you from losing the contents of a disk.

Sometimes (and the reasons vary) a file may not close properly. To show you this, DOS puts a "*" in front of the file type in the directory -

10 "YOURFILE" *PRG

DO NOT IGNORE THIS TIME-BOMB. The BAM will not be upset (yet), but the Scratch command cannot erase the file from disk storage or the directory. Validate is your salvation. The old BAM is thrown away, and DOS looks up every active file, traces through the file noting each sector in use, and builds a new BAM as it goes. Unclosed files are ignored in the process, so the block count is accurate. Better still, the unclosed file is removed so that it will do no further damage to disk order.



If you DO ignore it, it is likely that the organisation of the particular disk will deteriorate until you can no longer read it.

While looking at Track 18 Sector 0, the rest of the sector holds the disk name and ID that you gave it, plus the DOS version (2A for a 1541). If you peek around 18/0, you may find a few funnies from time to time. I have found things like "BLOCKS FREE' written there when the words really have no business in that block.

While on the subject of Track 18, we could go on and talk (endlessly) about the directory proper. But as this series is to help you get started, I will keep deeper discussion for a later series. But WEDGE can be used very effectively to work with directories, so let's look at the major wedge directory commands.

You will have worked out how to read a directory by loading it into memory as a program file -

LOAD"$",8
then LIST

This has the effect of wiping out any program you might have had in memory, as the directory is treated just like any other program. WEDGE treats you more considerately. Using WEDGE syntax, the directory can be listed to the screen only, so your program in memory is not disturbed -

>$ or >$0 or >$1

If the screen listing goes too fast, pause it with the space bar (tap it again to restart the listing). If you want to quit reading the directory, the "STOP" key is handy. If you have Version 5.2 (DOS 5.2 is the usual name) you can save typing by pressing "=" then RETURN. A truly lazy routine!

Handy tricks

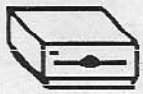
Do you remember "don't care" and "wild card"? You do? Fine, that's a help. Try this -

>$0:FROG*

FROG may not be the correct choice for the disk you are using, but let me explain. If your disk had FROGGER, FROGMARCH and FROGMIST on it, the syntax above would search and display only those three entries, plus the usual disk "header" and "blocks free" information. So you can pattern search your disk for that pesky program that you can't find without having to read metres of scrolling directories (and, like me, blinking at the wrong moment).

The wild card "?" can also be used to good effect. You could combine don't care and wild card to be even more selective -

>$0:FR??GE*



would find only FROGGER in the example given here. Handy if you can't recall the exact name.

Another syntax can be used to find, say, the one SEQ file on your disk -

>$0:*=S

Or try this

>$0:FROG*=P

This will give you any PRG files having FROG as the first four letters of the file name. Experiment for yourself.

WEDGE lets you load and save programs with simple commands -

/FROGGER loads FROGGER, like LOAD"FROGGER",8
FROGGER loads FROGGER and runs it.

If the file is not to be loaded to the usual Basic load address then you would use -

%MAYDAY which is the same as LOAD"MAYDAY",8,1

Try wild card and don't care with these commands. As your experience grows, you will find great value in these short cut methods.

WEDGE also helps with SAVE. You would have used:-

SAVE"LAST TWO",8

but may not have used -

<- LAST TWO

which does the same thing. It may not seem much to be able to omit the LOAD or SAVE words, the quote marks, and ',8' or ',8,1', but as your disk experience grows you will type these commands many times. I'm a bit lazy, so the simpler syntax appeals to me.

The last three WEDGE commands are not used often, but can be helpful.

The first command resets the disk drive - just as if you turned it off then on again -

>UJ

The second command changes the target drive number for WEDGE - the device number that it uses when automatically OPENing and CLOSE-ing channels for use with your WEDGE commands. Note that it does NOT alter the device number that the disk drive thinks it is. You have to do that with a software or hardware change -

>#9 sends any future WEDGE commands to Device 9

>#8 would then redirect commands to Device 8

Lastly (aptly?), if you want to disconnect the WEDGE program from the computer operating system, use -

>Q

or Quit, as if you hadn't guessed.

I have used the '>' symbol throughout these notes, probably because I grew up with the original program that only allowed that symbol. As WEDGE matured and was rewritten for later Commodore computers, the '@' symbol was permitted as an alternative to '>', probably because of different keyboard layouts and to save having to shift some keys to type the wedge symbol. The C64 WEDGE supports both '@' and '>', so choose for yourself.

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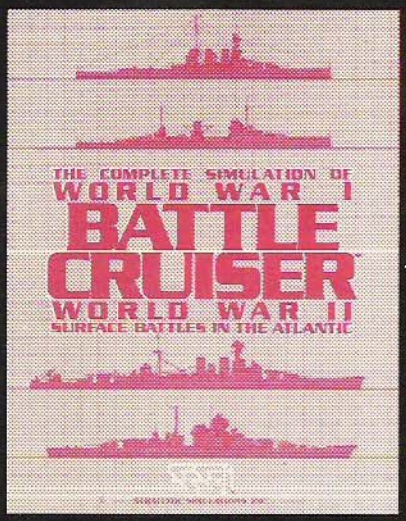

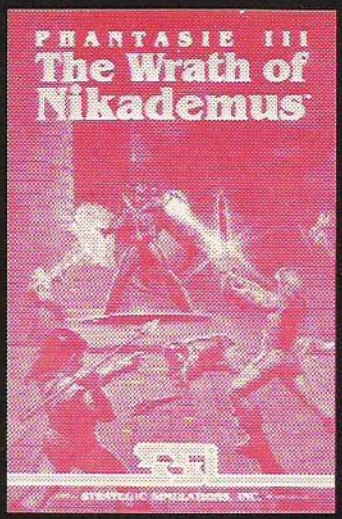

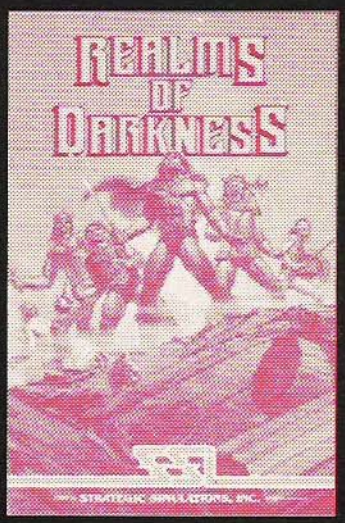

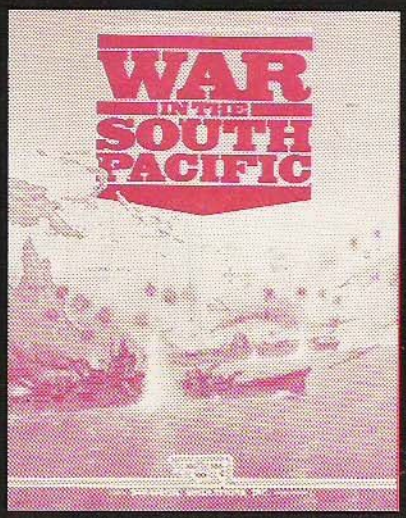

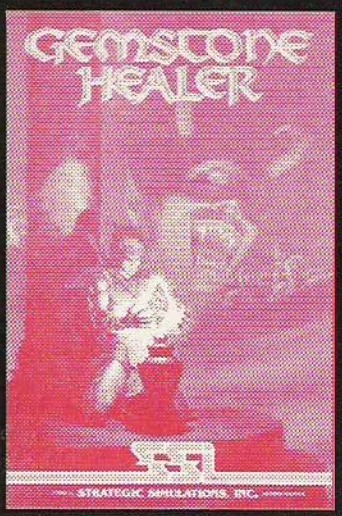

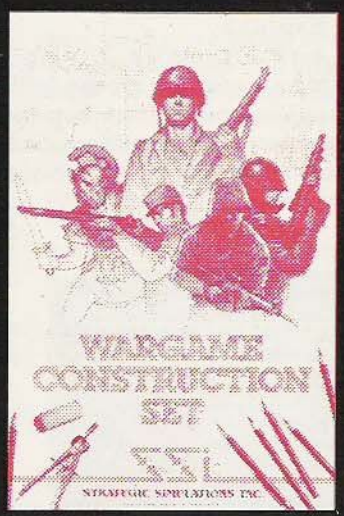

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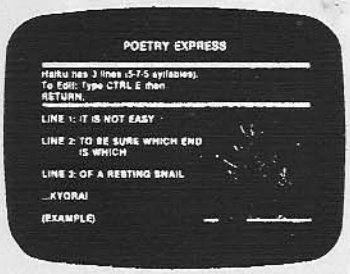

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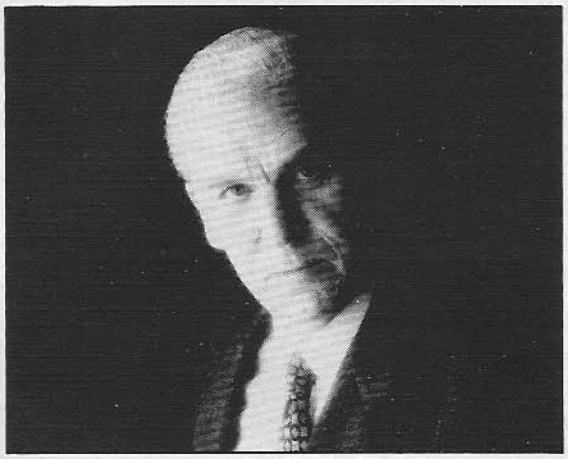

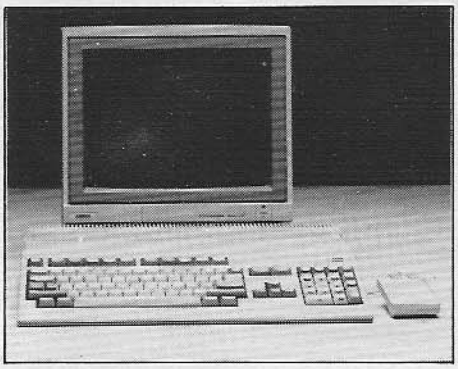

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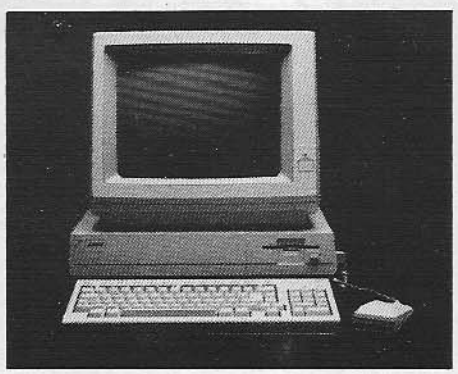

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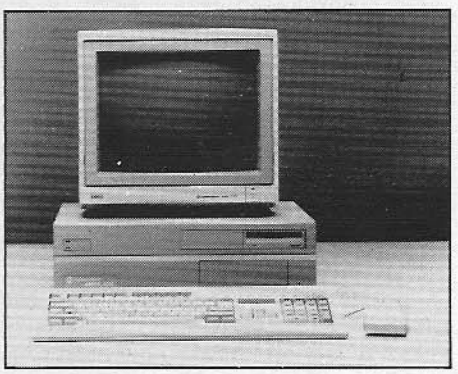

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AMIGA

ARE YOU KEEPING UP WITH THE COMMODORE AMIGA?

Games

It is easy, very easy, to get bored with a computer game. Poor graphics, bad sound and absence of proficient musical score contribute to a program quickly wearing thin and losing impact with even the most novice of adventurers.

Like most of rock and roll, when it comes to computer games, everything's been done before. There's nothing too original any more and sometimes what you're getting in the late eighties is rehashed works of icon art mish-mashed with music once heard before, but from a different distributor.

Because the disappointment sets in early on after initial loading and there is nothing we can do about tapping into originality unless to program a game ourselves. The best course is to look for one that involves comical animation.

This is, of course, only my particular preference, but you'll easily decide that there are only so many aliens you have the heart to destroy and all that hostility does nothing for your complexion. Games such as *Short Circuit*, *Road Runner* and *Boulderdash* have become my favourites due to their warm qualities and laughable antics.

Fantasy, darkened corridors into dangerous minds, are hugely debilitating and turn a user off from about the second kilometer of mapping if they continue to dwell on old hat evil.

Which country

The geographical derivation of the games has a marked effect on what you can expect beneath the cover. Britain is absolutely psycho - the more deranged and grotesque the game the more sucked in a Bristol youth becomes. Don't forget that this is also where soccer has become a Falkland Islands II instead of a Sunday afternoon walk in the park.

The U.S. are clever in their imagination and due to their extreme melting pot of phenomenal brilliance they come up with the best the world merges to offer. Here in Australia we seem to be more prone to quirky little adventures with a broth of razzle- dazzle thrown in.

I think that games will gradually, and not slowly either, lose their impact on the Australian market. They will remain popular to an extent, but just as sequels to a blockbuster movie have that contagious fate of disaster about the third time around, so to do we see the unprofitability of sameness and bad taste.

Games like the *Road Runner* mixed the gentle colours of cartoons with a natural setting in a New Mexico desert and made it not only pleasant to the eye but excited the curiosity into seeking the end of the highway three screens over and four to the top. In outer space one alien looks pretty much like the kinds you'd find on any London subway at two in the morning and cancerous growths about to suck your energy supply dry become obseleted into a nuisance factor we don't have to desire.

Road Runner

Adventure games are stimulating if combined with the periodic chance at animation and getting to try out what you can of the game after wandering hopefully around the hallways of befuddlement. Too many single word commands, or inane mechanical phrases get up both your nostrils simultaneously and quite rapidly fizzle out into yawning nothingness.

Yes, the winningest game is that which is simple but effective. *Mr. Do* type functions that share the screen with an edgy chase through a fabulous plastic land. Or the well-prepared car rally that mixes with a clench-fisted dream of commanding the super car yourself. Yes, it can all come true on the computer screen for a fleeting fantastic moment within your own mechanical world.

Facets of the game include things like scrolling landscapes. This is the way the panels roll across the screen, either left to right or right to left. A ladder effect means that as you progress the distance of the panel say towards the top and exit the panel you immediately enter a new panel and perhaps even a new screen. One game that used this effect in particular elaboration is *Friday the 13th*, transporting the character to various locations even a group of four by walking back and fourth around the corner of the monitor screen.

Graphics

Graphics depend on the kind of budget the programmer has at his disposal. Someone like Andrew Braybrook, well-established and certain of a large margin of popularity, has the time and the energies to develop something outstanding, incorporating dazzling three-dimensional effects, high-resolution colour and a fine team of musicians to compliment the exceptional graphics package. A twelve year old kid hammering away at the keyboard of a discarded Wang will be hard-pressed to come up with a rival to Frogger, but not surprisingly, and because of their sheer simplicity and total reliance on freshness, good games emerge. Usually very challenging and teasingly unsuspecting.

Sports games are always popular. The kind that involve two or more participants and egg us on to amazing glory.

Short Circuit

NetComm believes Commodore owners have waited long enough.

It seems Commodore owners are a patient lot.

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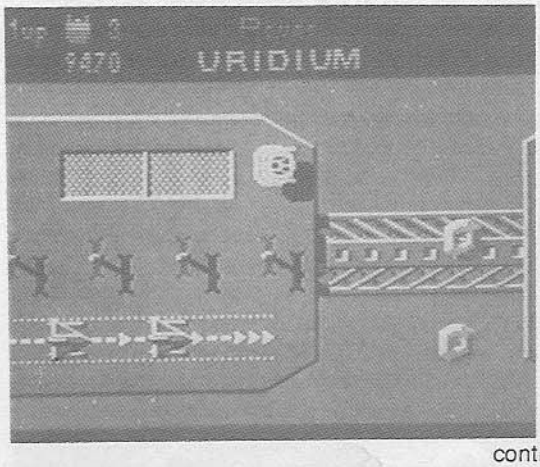


Uridium

Mr. Andrew Braybrook's orbital adventure against the "Super-Dreadnoughts" of his world, draining the mineral resources from their planetary cores for use in their interstellar power units.

A high-class action thriller which takes you from the mothership in a Manta-class jetfighter to a hectic flight path over fifteen different planets. You must attack the defence system of enemy fighters, neutralize the majority of surface defences and then land on Super- Dreadnought's Master Runway.

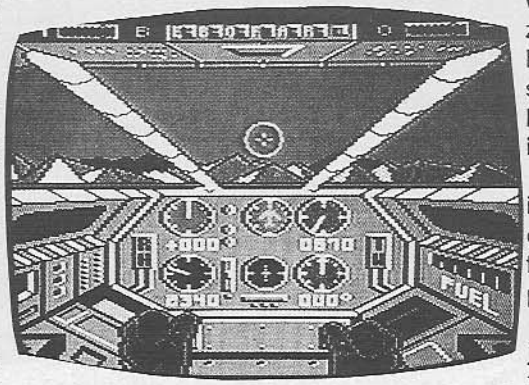
Beware of meteor shields, communications aerials and head-on collisions with enemy craft that do nothing for your jet. A too low velocity forces your jet down to the susceptibility of easy missile onslaughts, but if you go fast enough you can outrun them. The Manta fighter is quite a sporty little instrument of gymnastics and versatility, a sort of techno-Jonathan Livingston Seagull, in a great game with plenty of action and quality graphics and sound.

Infiltrator

A game as complex as any aircraft's instrument panel and as dicey as any dogfight from World War II. A man, a mission, with heavy artillery and major security to invade. It's dynamic action into a zany flight of computerized hell.

Upon entering the cock-pit of your jet-copter, officially labelled "Gizmo DHX-1 Attack Chopper" you find yourself facing an ultra- sophisticated array of controls. An airspeed indicator showing Gizmo's speed in knots by digital display, the Automatic Directional Finder, altimeter, RPM indicator for chopper blades and directional compass.

Artillery includes four Whizbang Waster air-to-air heat seeking missiles, two rapid fire Whizbang Whizzer 20 mm cannons, anti-heat magnesium flares, anti-radar guided missiles, chaff dispenser and a montage of every conceivable state-of-the-art computer guidance, control and surveillance communications systems. With all, it's a mesmerizing dog-fight against as well equipped enemies that you must decipher as such and blast from the wind. Two phases, from the flight into the hostile boundaries to



landing into the compound of a high-security center and demolishing the premises.

An awesome little package of fun and pizzaz.

Critical Mass

The best thing in adventure and questioning action this side of *Infiltrator*, is *Critical Mass*. Described at the time as a feat of incomparable skill. With dynamically realistic features, good colours, and three-dimensional patterns it takes you across an ugly planet to the hectic conflict of intruding on the alien enemy power plant.

The power plant is heavily guarded by a protective wall, mines, and amorphous clouds of molecular disorientation. To enter the power plant you first have to shoot out the robot guards and keep moving for fear of being hit by a guided plasma bolt. Then, it's a flight towards the force gates and nearer still to the all-important energy transfer beam. This must be destroyed by shooting out the energy concentrator in the middle of the device. But, if you fail to hit your designated target you'll be drawn into the beam and vaporized.

Score increases for each alien destroyed depending on its type, and additional points awarded for completing zones. It's critical, it's a lot of fun.

Parallax

Five specialized astronauts readied for an important mission to some place north of the sun. A space probe has landed you and four of the world's most experienced astronauts on an artificial world divided into five broad horizontal zones: Alpha, Beta, Gamma, Delta and Epsilon. Vital information is being switched across the zones by a controlling computer intelligence revealing an imminent attack against Earth!

Your spacecraft is IBIS. Beginning in the Alpha zone you proceed through each area locating your colleagues and finally reaching the Intergalactic Teleport at the exit in the Epsilon zone.

The controls are manipulated by a joystick for in-flight movements, either to dive, climb or turn in a clockwise or anti-clockwise direction. Keyboard control is used for raising or lowering of landing gear, turning your protective shields on or off, shoot lasers, display datacards and passwords. In addition to the controls there is an on-board computer activated by your joystick to move the cursor over a required option and pressing fire to select.

A magnificent effort at spectacular presentation, great graphics and lots to do. Progress through levels, insert computer cards to access, watch out for black holes and think fast. The colour is vivid, sound and musical score first-rate. A tidal blitz of magical proportions.

Alleykat

A multi-mode speeder capable of highly ambitious maneuvres. An intergalactic stunt car that you take into compe-

titions around the universe within eight orbitting space stadia scattered around the galaxy. You choose between demolition derbys, time trials, endurance epics and other rivetting battles.

First up the player gets presented with a list of races separated into months. On top of the screen you get a current account display in Guineas and select the races you can afford to enter. You begin without money but the first five races are free to enter.

The race begins. The Alleykat speeder supplied by the race organizers is dropped into position and launched. The tortuous landscape, the computer-controlled Gravo-craft and dreader Katerkiller stand between you and the finishing line. When the race is over you awarded points for Gravo-craft kills and bonus points earned for a particular race type. The craft has two flight modes, speed and combat. The Alleykat is fast and maneuvreable.

The graphics are sensational. Eight different types of landscapes and superb musical scores. Lots of people love it.

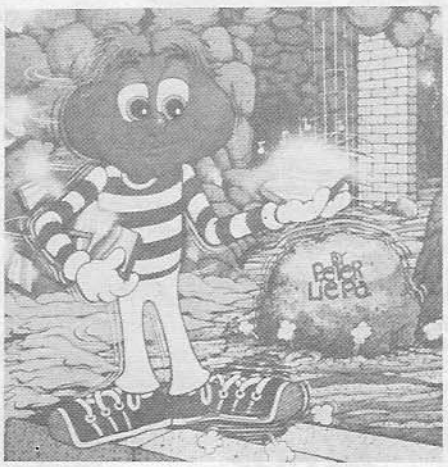
Boulderdash

Into a wonderful world of animation of color, sparkle, vibrant characters. And Rockford is the star of the game. He's in search of jewels and is frequently caves and hollowed caverns of the earth to find them.

The objective of *Boulderdash* is to search throughout each cave and collect as many jewels as possible in as short a period of time. Once the indicated amount of jewels are collected, the door to the mysterious escape tunnel is revealed to you and you go on to the next level.

Rockford starts off his journey in the first cave of the program. There are 16 caves in the game comprised of several scrolling landscapes. He must search the cave before the timer on the particular cave runs out. But there are many things to hinder your progress. There are nasties within the soil that don't appreciate Rockford messing with the soil and the baubles cloaked inside.

You start with three chances of success per game. Bonus tries are awarded every 500 points, and as Rockford tunnels his way to the different caves these will shimmer and again, bonuses are awarded. Boulders are the main hazard of the play, as they often stand between



Rockford and the entrance to the caves, block tunnels and hide the locations of jewels within the caves.

There are many other thwartable misdeeds lurking about and contribute towards the game's savoury mystique. It was one of the more popular games of 1987 and a classic in the arcade archives.

Iridis Alpha

The long-deserted world of the Iridians, an ancient and peaceful race who were possessed of wondrous technology. Eons ago, the Iridians evolved spontaneously into beings of pure color and decided to go tripping off in a trek of vanity into the universe and crowded subway platforms. Before they left their homelands, to stop it being invaded, they installed lots of nasty and distinctly hi-tech defences to discourage casual visitors.

At the heart of these defences is a bi-existentialist field which permits the planet to exist in two reality states at one time out of a possible five in total. Your aim, as you battle on from one reality to the other is to transfer energy that you accumulate to the core deactivation system so that you can enter the special bonus phase. There is a multi-dimensional time construct that relates subjective and objective time.

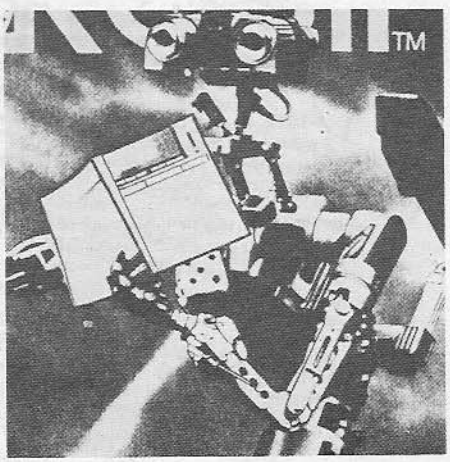
The Iridians have rigged a multiple phase reality field around the whole planet allowing to exist in two realities. The object to steal this technology that enshrouds the planet. You become a Gilby rocket fighter with the task of visiting each of the five realities and deactivating all the defences.

Freaking out graphics and music, fast, dynamci and too cool for its own good.

Short Circuit

S.A.I.N.T. robot number five. Strategic Artificially Intelligent Nuclear Transport. A frazzled adventure.

Opening frame finds you, as Number 5 inside the Nova Robotics building. You must maneuvre him around the lab and adjacent offices in a search for helpful artifacts, hardware and software needed to activate your laser and jump mecha-



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A RESET switch is fitted.

(We have found this to be "unstoppable", it even preserves the tape buffer).

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"128" and 1570 compatible in '64 mode.

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(These figures do not allow for searching)

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nisms and find the technical manual to help you build a decoy robot in the second part of the game.

You start off with the ability to search and manipulate objects. YOu search an object by facing it, selecting SEARCH as your current program and firing. You will then bve informed of any objects found and if you press fire again it will allow you take the item.

Then there's a phase known as UTILIZE. Pressing fire you can use the item you have or moving into JUMP mode allows number 5 to ...jump. In this section of the game you must solve puzzles and outwit security guards, then make your bid for freedom outside the walls of the complex. On the outside of the Nova Robotics laboratoy you are pursued by other S.A.I.N.T robots programmed to deactivate you, and security guards out to kill. The only hope of survival is to build a decoy robot to be destroyed in your place.

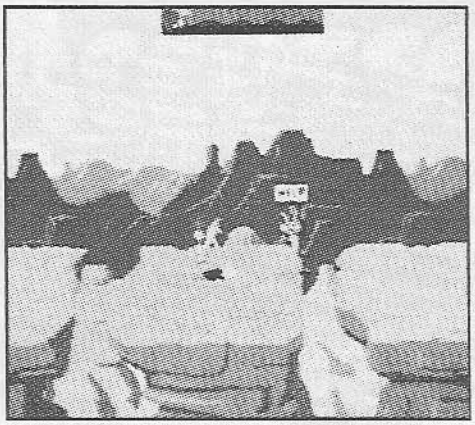
It's a fantastic achievement as far as a computer game story line goes. There's much to do, and lots of fun action. The #5 screen character is identical to the movie representation and has excellent movability across a very fine graphic scrollscape. Defintely a pleasurable investment and one that you won't get sick of for a long, long time.

Road Runner

The caption across the front of the package reads: "Cartoon's most elusive character has finally been trapped." The Road Runner trapped! Now that is front page news. A feat of near impossibility, the greatest challenge known to modern man and coyote.

Popped up on screen, *Road Runner* quickly became my favourite game for 1987.. Just being able to delve back to my happy days of a life where you had time to watch cartoons, and always time for the sarcastic whims of that supercilious bird of the desert.

For a change we're cruising left of the screen, backtracking through the traffic flow and sailing downstream. And they're off! to the simulated tunes of the Warner Bros theme track. Objective number one is to keep ol' Roadie fueled up with strategically deposited birdseed.



With the wolf-type creature rocking hard on his fouled feet it becomes your duty to out-maneuvre the wolf, firstly into the New Mexico desert freeways and then into the traffic. Don't get yourself run over here - it will cost you a life, however if the coyote gets it we're talking an extra one thousand points.

Then it's a class A racing circuit through fabulous twists and bends with a so-sweated chase through the curves it kills you! You think you're just about there and BANG! the coyote straddles a rocket and he's turboed himself into dangerously close reach. Then you're into the next phase...boulders hurtling down from an Arizona cliff face and check this one out - the coyote has this souped-up pogo stick and you don't know where's he's going to bounce next! It's a marvelous game!

All told, *Road Runner* is a totally magic program. They've really done well in perfecting classic animation, and with extremely good graphics and color harmonized with such an artful creation, you're looking at a very worthwhile investment in your time and wallet depreciation.

If you want the chance to see the cartoon psychopath finally get that smart bird, then hook into this outrageous new program and don't stop until the wolf is away from your door!

Robot Rascals

We're talking a difference here in the standards of programming and display. The manufacturers - Electronic Arts - and could any other label describe so well the true technological professionalism inside its box?

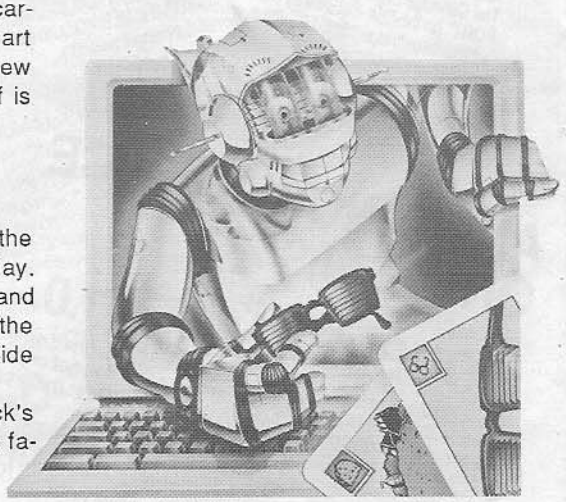
Up to this point, Bruce Artwick's *Flight Simulator* had been my all time favorite, Andrew Braybrook came close with *Uridium* and *Parallax* was even closer, but now, well, I think I'll be taking *Robot Rascals* off the shelf every time I'm playing for pure fun and enjoyment. It's just so good.

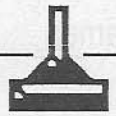
What you've got happening here is a scavenger hunt with a touch of mischief. It combines the best elements of a computer strategy game and multi-player board game. Scavengers search for artifacts that are randomly assigned through use of the item cards, while game play is affected by luck cards and random "global events" controlled by the computer. The winner is the first player to return home with all of the artifacts shown on the item cards in his or her possession.

Each scavenger in the game controls a Robot Rascal. The robots are used to rove around the planet Laustenfownd looking for items. All robots have the same abilities: they can locate items, steal items from other robots, and erect shields that protect their items from being stolen by other metal guys.

There are two sets of cards in robot rascals. The item deck card represents artifacts that can be found on the surface of Laustenfownd. The luck cards give players the chance to improve their hands, often at the expense of other players.

Laustenfownd is the world, the board where you hunt for items. The computer displays an overview of the Laustenfownd on the left and an enlarged map of the area around your robot in the center. During your turn you use the joystick to move your robot around the board in search of the things shown on the item cards





you hold.

After everyone has chosen a robot, the computer announces a global event in effect for the first round and randomly changes the order in which the players take their turns. During a turn, first take a luck card, follow the instructions on it, then use the joystick to move your robot up, down, left, right or diagonally on the map on the center of the screen.

The centre map shows a blowup view of your robot and its immediate vicinity. The map to the left shows the entire playfield on Laustenfownd, with your robot identified as a dot that flashes twice as fast as the other player's robots.

Your biggest hassle throughout the game is the rapid loss of energy. It just seems to get zapped so fast.

The manual is complete, readable, well laid-out. The graphics are totally superb, the sound is adorable. Presentation rates one of the best I've seen with colour that just won't quit.

It's pushed as family material, and it's got every avenue covered in that neighborhood. It's the computer age and even though Monopoly is great when the power's down, now is the time to charge up the Commodore and get the 21st century into the living room where the fireplace and popcorn maker used to be.

World Games

Traversing the globe in search of a football, a stick, a bat and spongy ball, anything to get the mind in gear and pulse speeding towards a grand final.

We remember *Summer Games* and *Winter Games* from a couple of years back and we exulted in the astounding collection of graphic delights that were then presented. Well, now we take it one step further and to a different type of sport that they rarely ever show on national TV. What we're discussing here, friends, are limb-wrenching activities that happen in exotic locales, to trek the globe and play foreigners for the rights that were once only confined to their nation.

What I'm talking about here is an Elvis Presley number diving off cliffs in Acupulco, wrestling your guts out with a sumo wrestler in a sleazy pub on the outskirts of Yokohama, jumping wine barrels in the Black Forest of the Fatherland, then head back to the real western world in the good ol' U.S. of America to bronco ride the meanest, orneriest bull in the Texas panhandle, or try the near impossible log roll in the lumberjack hangouts of far north Canada.

World Games challenges your competitive skills with a series of athletic contests for one to eight players. You travel to eight different countries including Russia for weightlifting, Germany for barrel jumping, Mexico for cliff diving, United States for the bull riding, Scotland for the caber toss and Radio City, Japan for the ultimate tangle - sumo wrestling.

World Games is an impressive collection of fun. Interesting, compelling, laughable.

Colour is wonderful, graphics above and beyond the call of ordinary games, and the music and sound complement the exceptional flavour of the program.

How does a joystick work?

The joystick has four switches inside it, one for each direction, Up, Down, Left and Right. To get diagonal movement we actually press two switches together. Thus we have eight different directions as shown below.

Each joystick also has a fire button, which is just another switch.

How the joystick is connected

The joystick is controlled by a versatile chip known as the MOS 6526 CIA (that's Complex interface Adapter) By reading that chip we can find out in what direction the joystick is being moved and that is exactly what the program does. Because of the way the joystick is wired to the 64, we must decode the value we get from the MOS 6526 before it is a number that is easy to use in a BASIC program. (For more detailed information on how the joystick is actually interfaced to the 64 see page 344-345 of the Commodore 64 Programmers' Reference Guide.)

There are two memory locations that our program must access to read the joysticks, location 56321 for joystick 1 and 56320 for joystick 2. The joysticks are both read in the same way. Each joystick requires 4 bits from each byte for the 4 switches and 1 bit for the fire button. If a switch is pressed the appropriate bit is set to 0. Otherwise the bit is set to 1. Thus bit 4 will be set to 0 if the fire button is pressed and set to 1 if the button is not being presse. Likewise if the joystick direction is up then bit 0 will be 0. Otherwise bit 0 will be set to 1. Tabile 1 shows which direction each bit represents.

Table 1
Bit Direction
0 Up
1 Down
2 Left
3 Right
4 Fire Button

How the program works

The machine code routine has two parts. The first part, called SETUP, changes the interrupt vector of the C64. so that whenever an interrupt occurs the second part of the program, the actual joystick read routine, is executed. The second part called READ reads both joysticks in turn and saves the results. Listing 1 is the assembly language source code and may be entered using the Commodore assembler. Listing 2 is the same program though stored as data statements in a BASIC program.

The program reads the joystick ports. It tests Bit 4 (firebutton). If the bit equals 0 then the fire button is being pressed and the program stores a value of 1 in the firebutton location. If the button is not being pressed the program returns a value of 0> Testing the joystick itself is a bit more complex. The 4 bits of the joystick form a 4 digit binary number. A 4 digit binary number can have 16 different values from 0 to 15. The program has 16 bytes of data at the location named DATA. Using the 4 bit joystick number as

an offset, the program selects the appropriate number from DATA onwards. This value is the diretion of the joystick.

After the program has finished it jumps to the standard interrupt routine, so that the C64 can read the keyboard and update the clock etc.

Using the routine

Once the program is poked into memory the setup routine must be called once. IMPORTANT! ONLY CALL THE SETUP ROUTINE ONCE.

The setup routine is called from BASIC by SYS 49152, from machine code by JSR $C000. After SETUP has been called the joystick is automatically scanned 60 times every second. To find out the value of the joysticks your program must PEEK the following locations:

JOYSTICK 1 251
FIREBUTTON 1 252
JOYSTICK 2 253
FIREBUTTON 2 254

In the BASIC program lines 10 to 40 read the data and pokes in the program. Line 50 starts the machine program working. It is important that the command SYS 49152 is only called once in your program. Lines 90-110 simply print the values of the joysticks at the top of the screen. You can change these lines to whatever you want. Good luck.

What's an adventure game?

For all those with a sore thumb, a bored brain and a will to explore the terrain of an unfamiliar world, or solve cryptic clues etched in a wall - adventure games are probably the missing link in your computer entertainment.

What is an adventure game? Good question, I'm glad you asked. An adventure game is a computer simulation of the human senses, that is, what you could feel, see, hear or smell in another world or place. This place has some type of problem, puzzle or objective which you must fulfill. The computer tells you what you see, etc; in response you enter a command and the computer will try to carry it out.

The following is a quick example of an adventure game.

Computer writes: You see - a fireplace, armchair, shelf.

You input: Inventory (this lists items carried).

Computer writes: You are carrying: matches, an axe, bottle of gin.

You Input: Light fire with matches.

Computer writes: The fire bursts into flames, smoke fills the room for a moment and then clears. A strange man is sitting in the chair, he starts telling you a tale.

"When I was a young . . . ."

This is a simple example of a possible adventure game; remember, a VERY simple version. In an adventure game called *Snowball*, you have to master the controls of a spaceship - not at all easy. In fact, that adventure boasts an amazing 7,000 locations aboard a realistic, planned background of a starship that could actually work (NASA will want to hear about this one).

I am an avid "shoot 'em down" video game player myself, but just think, when you would like to play a game for a few hours how many "shoot 'em down" games have the lasting appeal to stop you from chewing your fingernails? Of course, there may be times when you only want to play a game for a few minutes (although I find when I sit in front of my 64 I'm usually there for quite a while).

There are a few different kinds of adventure games, and I shall explain each one in turn.

Pure text — These adventures usually take a great deal of concentration and have a huge amount of puzzles, problems and strange situations. Of course, they are just text - no pictures. A good example is the amazing *Zork* series.

Text and graphic — As the name implies, these are text with major scene pictorials (such as *The Hobbit*, which is just as hard as pure text adventure) or a graphical representation of every location in the adventure (this takes up a lot of memory, so the adventures are usually simpler). The beauty of this type of adventure is that a number of people can input ideas as a group effort (a great family game), because it is simpler and easier to follow. An example of this type of adventure that I enjoy playing is *Mystery Island*.

Graphic adventure — There are few good graphic adventures around. The most impressive example is *Ultima III*. This type of adventure is most likely to please the eager "shoot 'em down" player, for it usually incorporates the hand-eye coordination needs of the classic arcade games. You still need to solve problems but they are usually fewer and far less difficult.

Fantasy role playing — This is a feature of an adventure game rather than a type. In theory it can be incorporated in every type of adventure, but it is most often found in the graphic adventures — *Dungeons and Dragons* players will know what I am talking about. The idea behind fantasy role playing games is that you create a person with certain primary abilities, such as strength, intelligence, dexterity (agility) and wisdom. These various abilities allow the person to excel in a chosen field - a person with high stength would become a warrior and a person with high dexterity would become a thief. These fields would be in relation to the game. A game in the future would probably consist of psychics, weapon experts and space pirates. A game in the era of King Arthur would include knights, thieves, wizards and clerics.

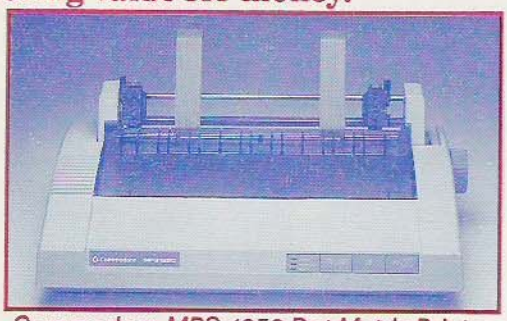
There is no best type of adventure, all have good and bad qualities. A good hint for most adventurers is to imagine you are actually there facing the exact problem - what would you do? If a face of stone is protruding from the wall with a mouth open wide, would you put twenty cents in its mouth, follow a cryptic clue found on a rock or put food in its mouth; such are the dilemas of the adventure game.

WARNING — Adventure games are mentally stimulating.

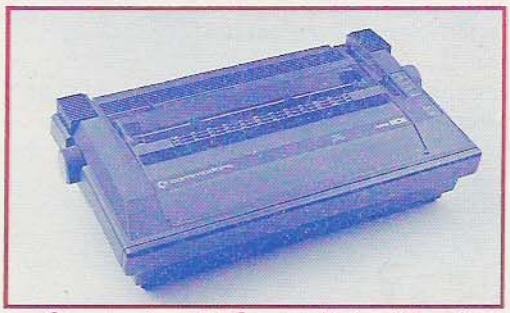
COMMODORE PRINTERS

For every Commodore computer there is a Commodore printer that is designed to cover your specific needs whether you are an owner or user of a Commodore 64 or 128, an AMIGA 500, 1000 or 2000, a PC 5, 10, 20 or 40.

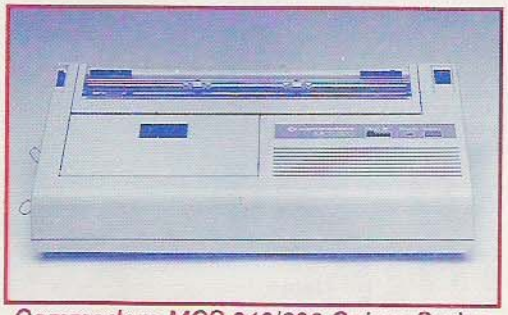
Commodore printers are designed to give you total compatibility with the rest of your computer system with built-in high performance and at the same time offering value for money.



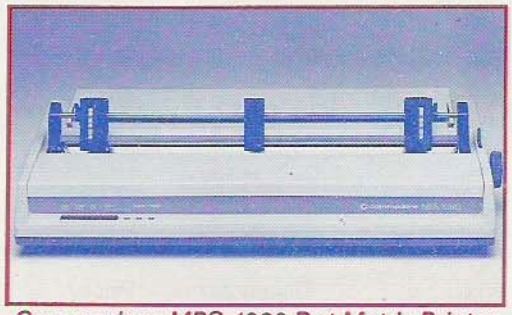
Commodore MPS 1250 Dot Matrix Printer



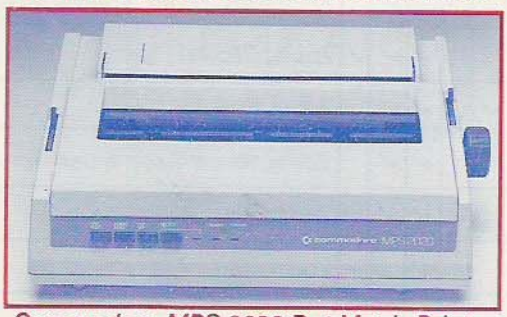
Commodore DPS 1101 Daisy Wheel



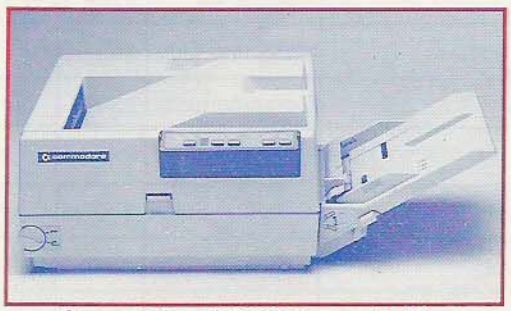
Commodore MCS 810/820 Colour Series



Commodore MPS 1280 Dot Matrix Printer



Commodore MPS 2020 Dot Matrix Printer



Commodore LP 806 Laser Printer

commodore COMPUTER

This document was produced on the Commodore LP806 printer.

Graphics

Commodore created one of the most graphically advanced home computers of its time when they first released the Commodore 64. Although the Amiga has long since surpassed the 64's powerful VIC-II Chip, it still stands as one of the best graphics chips around for the money.

The VIC-II is an updated version of the original graphics capabilities of the Vic-20 computer. Forty columns of text may be displayed in any one of fifteen colours. A variety of other graphics modes, as well as the ability to produce sprites, have led to some excellent drawing programs.

Programming graphics is difficult. Without extended BASIC commands provided by cartridges such as Simon's BASIC and Ultra-BASIC, the process involves many dozens of PEEKS and POKES just to produce a single line!

Thankfully, a swag of powerful graphics editors make the job of creative drawing a simple and enjoyable one. The following summation takes a look at those packages which are still available in Australia. Others may exist, but no longer be distributed, which we have not mentioned.

For the technically minded, the Commodore 64 has only two graphics modes, but several colour modes. In bit-mapped graphics display consisting of 320 x 200 dots is produced, in two colours per 8 x 8 dot matrix.

The same display, with a reduced X resolution may be produced in Extended and Multi-Colour modes, as can the 40 x 24 text screen. If you like this can be considered as six graphics modes. The built-in character set can be re-defined, and the entire display scrolled eight bits either left, right, up or down.

Sprites, which are small movable objects 24 x 21 bits in size, can be displayed in any mode, in either hi-res or multi-colour. There are eight in all, each with its own special register for collision detection with the background or other sprites.

These amazing little critters enable much of the smooth animation seen on the C64 today. More recently programmers have even found ways of displaying sprites in the border surrounding the text or graphics screen - a feature that is undocumented, and supposedly the result of a hardware fault.

The world of graphics is exciting, and one that appears only now, after five years of existence, to have reached its limits on the Commodore 64. We await the discovery of what Commodore's latest development, the Amiga, will yet produce.

Graphics Programs

Name	Distributor	Price	MULTI-COLOUR	HI-RES	JOYSTICK	MOUSE	TOUCH - PAD	LIGHT-PEN	PULL- DOWN MENU	PRINT OPTION	TEXT	ICONS	Notes
Artist 64	Pactronics	$79.95	✔		✔	✔					✔		Animation, Zoom, Special Effects
Blazing Paddles	Computer-One	$69.95	✔		✔	✔	✔			✔	✔	✔	Zoom, Clip-Art
Flexi-Draw	Computermate	$399		✔				✔		✔	✔		Zoom, Clip-Art
Doodle	Unknown			✔	✔					✔	✔		Zoom, Menu, Easy to use
Image System	CRL/Ozi-Soft	$49.95	✔	✔	✔				✔	✔	✔	✔	Zoom, Special Effects
Koala Paint	Unknown				✔		✔			✔		✔	Zoom
OCP Advanced Art Studio	ISD	$79.99	✔	✔	✔	✔	✔		✔	✔	✔		Zoom, Special Effects
Micro-Illustrator	N/A		✔		✔		✔					✔	Zoom
Geos	Commodore	$119		✔	✔	✔	✔		✔	✔	✔	✔	Zoom, Operating System

Contact List:
Pactronics (02) 407 0261
OziSoft (02) 211 1266
Computer-One (02) 399 8865
Commodore (02) 427 4888
Computermate (02) 457 8111

Artist 64

Artist 64 is sophisticated and supposedly out-performs any other Commodore graphics package.

Ideally the program requires the use of the MS2000 or NEOS mouse, however a joystick will suffice. Two disks are included, one of which contains the main program itself, the other a selection of utilities, demonstrations and example pictures.

For a guided tour of the program's capabilities, it's best to load up the included demo. This will take you through some of the more interesting options as if someone were actually operating the software for you.

The main menu is divided into two sections; one of which controls the colour palette, the other, the various drawing commands. This display is complex looking and could be a great source of confusion for those more familiar with the structured layouts of programs such as Micro Illustrator and Blazing Paddles. Artist 64 is more along the lines of a super version of Doodle - minus those useful help screens.

In short, this is my greatest complaint; whilst the power is there, getting at it is a little tricky at first.

Some options may be toggled or switched on or off. Various other parameters are adjustable.

Basic functions include line, free hand, ellipse, rectangle, triangle, and set colour for ink/paper/border. There's also an invisible grid option and a very smart magnify facility.

A small knowledge of geometry is useful in deciphering the manual, which delves into the world of polygons, axis of symmetry and the elusive rubber band mode. A polygon is a circle with square edges or an elipse with symmetrically square edges.

It is possible to print text on the screen in a variety of sizes from 5 x 5 to 160 x 200 dots or proverbial pixels (the default size is 8 x 8).

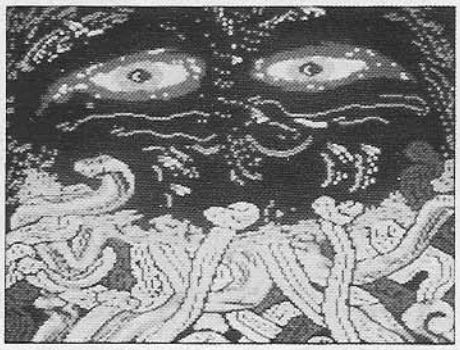
The limited memory available to the 64 makes it impossible to store a decent variation of fonts in a range of point sizes.

Artist 64's greatest asset is its ability to deal with colours and brushes.

Colour priority, cycling and block copying as well as definable patterns and brush shapes make it possible to create some incredible effects.

It is possible to cut out part of your drawing and use it as a brush. The way in which the colours overlap may be modified through use of the protect command. Certain colours may be made to filter through whilst others are ignored. This is very useful for creating incredible 3-D effects, as background figures may be added without erasing your foreground. You may design your own fill patterns in a similar fashion.

Various other features include user definable windows where you can limit the drawing window to any size of your



choice; sprites or brushes may be flipped horizontally or vertically; two screens may be held in memory at once.

It suffers from some cumbersome facets of its menu operation such as having to switch to a separate menu in order to execute the UNDO command.

The package is a worthwhile purchase especially for existing owners of the aforementioned mice.

Distributed by Pactronics, (02) 407 0261
R.R.P. $89.95.

Graphics Glossary

Art : Yes, computers can produce Art! Artists are often employed by game companies to produce title pages.

Bit-Mapped : Each bit in a section of the computer's memory corresponds to one dot on the screen.

Brushes : The shapes used to draw with. May range from one dot, to several dots. A few programs even allow for scattered dots, producing an air-brush effect.

Cycle : By cycling the colours in the colour registers, it's possible to simulate animation. This effect is used to show water flow in some pictures.

Extended Colour (Mode) : Available when using re-defined characters. Enables the use of additional colours, but reduces the number of displayable characters.

Fill : An enclosed area may be filled with a colour or texture.

Font : The characters sets available are known as fonts. Each font appear in a variety of sizes.

Hi-Res : Abbreviation for high-resolution graphics. Same as bit-mapped graphics.

Koala-Pad : A pressure sensitive tablet used for drawing. Used with a stylus, shapes drawn on the pad are reproduced on the screen.

Light-Pen : A special pen, connected to the computer, which is able to detect the current X, Y position on the screen that it is pointing at. Used for drawing pictures, and selecting menu options.

Magnify : Portions of a hi-res picture may be enlarged or magnified for detail work. Occasionally some packages allow parts of a picture to be magnified and stored as part of the picture.

Menu : A list of options or choices which enable the user to control a program's various functions.

Mouse : A small device that sits on a desk top. A ball in the base detects movement and translates this to a pointer on the screen. Normally between one and three buttons allow choices to be high-lighted and selected.

Multi-Colour : In this mode of operation an increased range of colours are available. As a trade off, the x resolution of the screen is decreased.

Paint : A brush must first be selected, which may then be used with a graphics program in much the same way as a paint brush.

Plot : Single points drawn on the screen are referred to as having been plotted, or drawn dot by dot.

Track Ball : The reverse of a mouse! A large ball mounted in a square case. The ball is moved to control a screen pointer in game figure. Light switches detect movement of the ball.

Window : An area within which activity takes place. A viewing point through which program operations take place.

Zoom : See Magnify

The OCP Art Studio

Once loaded a small two line menu bar appears at the top of the screen and an arrow as your pointer. Pressing the Commodore key and the space bar simultaneously allows you to toggle between four different input mediums. These include a mouse, koala pad, keyboard or joystick.

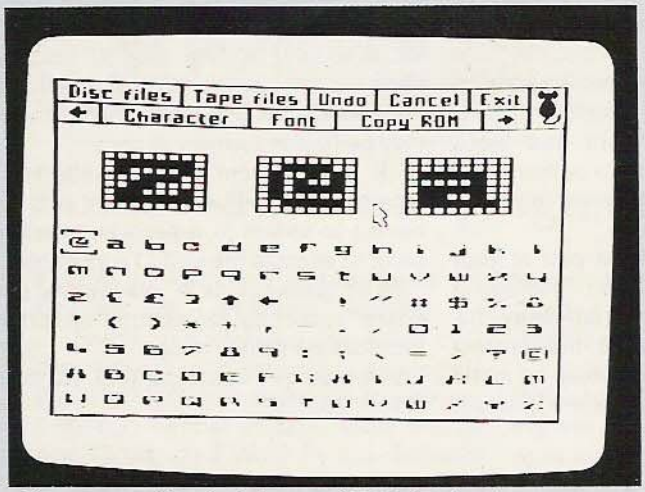
Having a Datex optical mouse handy, I tested it and found that it worked perfectly. The menu hides part of your display, however using a small slide scale it's possible to bring the hidden portion into view.

Options in the menu bar include print, colours, fill, paint, text, undo, file, windows, magnify, shapes and miscellaneous. Just to the right of these the current X,Y position of your pointer is displayed. By moving to any of these options and pressing the fire button, or left mouse or koala pad button, a pop down menu appears.

The pointer will then highlight the available selections. Pressing the button again will choose the currently highlighted option. I suggest the first thing you do is to take a look at the example picture called "Baboon" which demonstrates exceptionally well the potential of *OCP's Art Studio.*

Operating in multi-colour mode rather than hi-res like its predecessor, the package is capable of colour mixing in a similar vein to the *Micro Illustrator.* This gives you a resolution of 200 vertical and 160 horizontal dots or pixels. In OCP's Studio there is a range of facilities normally only found on software running on the Amiga, with the exception of one comparable package - *Artist 64.*

One of the most powerful functions is the ability to control colour priority and exclusions. The palette is selected using the simple to understand Ink, Paper, Border format.



Character editing in Advanced OCP Art Studio

By excluding certain colours it's possible to filter out unwanted background images when you are using the cut and paste function.

Using the Fill option you may colour an object quickly. You may choose between a solid, pattern or wash fill. If you make a mistake, pressing run-stop part way through the fill will abort the operation - useful when you discover unwanted 'leaks' in otherwise solid forms.

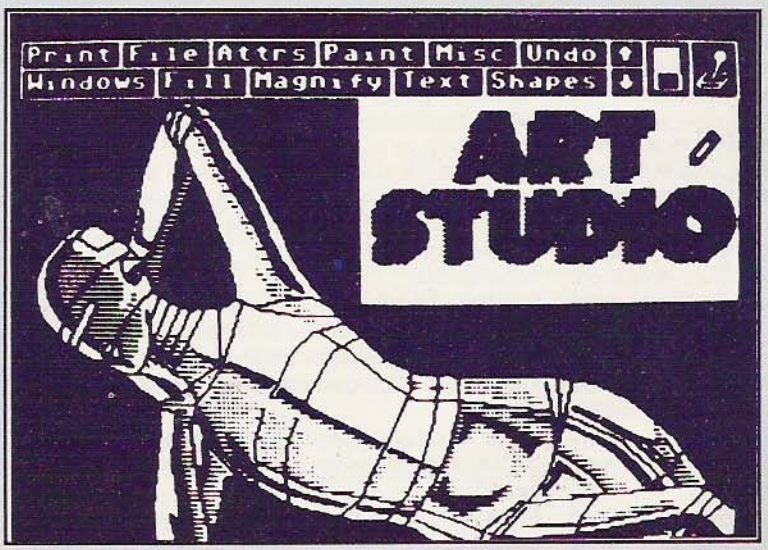
Pattern fill is very powerful, allowing a selection of twelve complete multi-colour patterns of varying size to be used. These may be edited and saved using a very powerful built in editor with flip, scroll, and copy functions built in.

Shapes

A variety of shapes are available, including lines, rays, rectangles, triangles, circles and ellipses. These may be stretched to the desired size and proportions using the elastic function.

Text may be added to your pictures, in a variety of X, Y sizes, spacing, and with optional bold or italic mode. Characters entered may appear left to right, right to left, upwards or downwards. Characters may be edited, and your own fonts designed and saved to disk or tape.

Easy to use, yet powerful enough to keep most budding artists well and truly busy.



The documentation is indexed, and a utility is included to load picture designs into your own programs.

So, as far as road tests go, the program performed well.

Crash proof and user friendly ... I recommend this one as first choice on my short list of graphics software.

Recommended retail is around the $79 mark. Distributed in Australia by ISD.

The Graphics Pirate (Graphics Utility)

The cartridge sits in the back of your 64 (or 128 for 64 mode operation) and is *completely transparent* to all current software, enabling you to capture virtually any screen of any program to store separately on disk for later editing etc. All you do is press the *Graphics Pirate* button, then swap disks in the drive (you can use two drives in the Editor modes) to save the picture onto your data disk.

Title screens from games and other programs can be captured in this way, and there's a really good slide show maker included which lets you use the captured pictures as a continuous show. In this mode you have the option to say how long the picture is to be displayed and if the screen is to be blanked or not between pictures.

The system uses Cockroach's own development, "Cockroach Compressed Graphics", for slide shows and it's a real credit to them that the pictures load and display so well (and so quickly!).

The Graphics Pirate "sees" a picture in one of three ways. If the picture on screen is a Hi Resolution picture then it will be captured in the *Doodle* format. If it's in Hi Res Multicolour then it will be saved in the *Koala* format. If it turns out to be a Lo Res screen made up from characters (as are a lot of games screens) then it will be saved in Cockroach's own format with the file-name ending in "-SC".

Any sprites in the picture *will also be captured* and saved in a format compatible with *Compute* magazine's *Sprite Magic.*

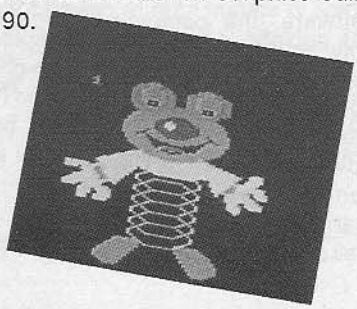
There is a very powerful Editor on the *Graphics Pirate* disk which allows you to extensively modify the pictures you capture.

There's still more in the *Graphics Pirate* set-up! You can use the Newsroom Editor to actually *load graphics straight from the ClipArt disks*, then save them as *Doodle* pictures for easy editing etc. Use F7 to flip through the directory of a ClipArt disk, then the cursor keys will move the graphic around the screen and press return to drop it into position. Pretty clever stuff, eh?

On top of all this you can actually print out your pictures, *including the sprites!*

All in all this is a very well thought-out, very user-friendly package. I have absolutely no hesitation in recommending it to anyone remotely interested in computer graphics and printing etc.

Distributed by Micro Accessories (08) 2870191 as Cockroach Graphics Utility - $75.90.



Cockroach Pioneer new graphics standard

Stu Burrows and Ralph Down, two of Australia's leading hands when it comes to whizz bang add ons for your Commodore 64, have created more than just another utility.

Any product which can handle a variety of other standards lends itself to greater usage. However the most important aspect of the Graphics Pirate software is the creation of a new standard.

Cockroach Compressed Graphics, or CCG files as they are better known, may be used to store a variety of picture formats including sprite data. Using compaction techniques, a bitmapped screen, such as a Koala Pad picture, may be stored in around 10 disk blocks. Certain pictures, such as a map of Australia, may compact to as small as four blocks.

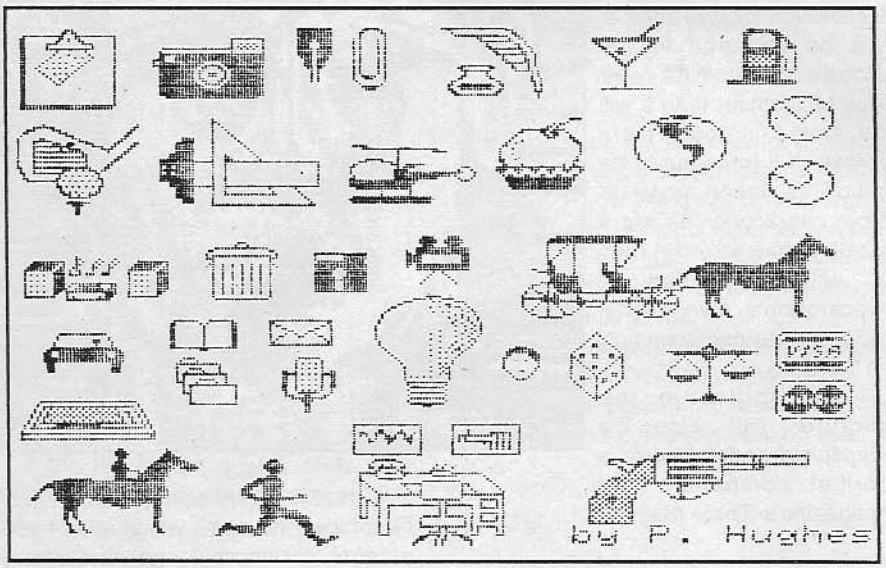
CCG files may also be used to store a normal text screen of information, even if it contains redefined characters. These compact down to as little as one block - with screens containing redefined characters taking around five to seven blocks.

Compaction techniques have long existed, but by establishing a standard by which they may be used in storing, retrieving and printing pictures, Cockroach Software are pioneering new ground. Full details on usage of this new standard will be released in a coming issue of The Australian Commodore Review.

Utilities for toying with pictures will then be able to deal with a variety of picture formats simply and speedily. At this time, the only software that will transfer pictures across to CCG format is the Graphics Pirate. However, other programs will no doubt surface in the near future.

Flexidraw

What's different about this program is that user input is provided by means of a light pen. Unfortunately while using the software I noticed that 'shooting' sometimes occurs. This is a problem inherent with light pens as a rule,



although worse if your screen is dusty, which causes static.

The package actually consists of a suite of software, with the primary drawing program being the focal point of all the related accessories. Let's deal with each of these separately.

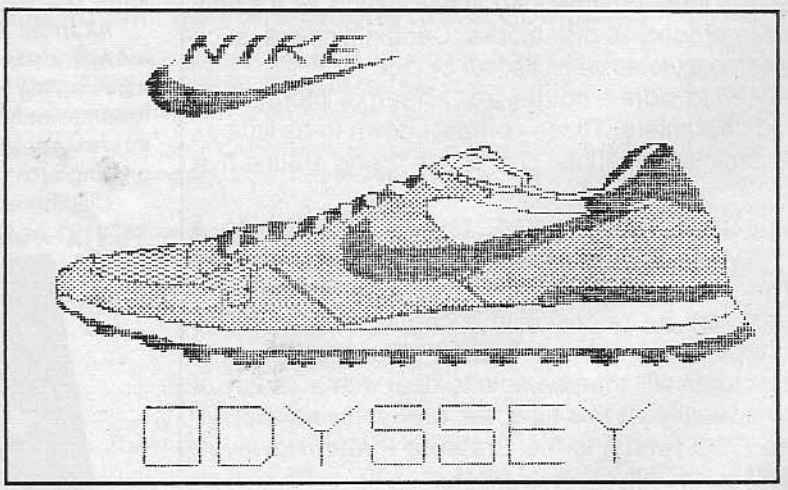
Flexidraw 5.0 is the most powerful of the included programs. A variety of draw modes allow you to spray, or draw in any of three pen widths, fill, paint areas of a design. No doubt this would be far more interesting if the colour facilities of the 64 were fully supported. In all there are 18 different fill patterns - Macintosh style.

Partly due to the limitation that a light pen would place on the software, the package only operates in grey scale. Some colour may be added using one of the ancillary programs, however this is a cumbersome process that is best left for the diehard enthusiasts.

When drawing pictures you're given two pages or screens to work on. If you want you can have both pictures displayed simultaneously using a novel split screen technique.

All the usual drawing options are supported along with a few out of the ordinary. Circle functions also include arcs and ellipses. There's 'box', 'straight lines' and a special filtered mode to help smooth out the usual bumpy freehand light pen doodles.

I was especially impressed with the large array of fonts available for use in the lettering mode. These include Gothic, Roman, Times, Art Decor and many more.



Text may be enlarged. Printing pictures gives you the option to enlarge by a factor of four. Documentation was beyond compare. Every aspect is covered in depth and suitably indexed for easy cross referencing.

Pen Palette is a half hearted attempt at giving the old b/w silent pictures a shiny new colour face lift.

The basic limitation applied is that you can only have two colours per 8 x 8 pixel block.

Transgraph Can only be used if you have a modem. Pictures may be transmitted to other users who have *Flexidraw* - a pleasant addition if you're into that sort of thing.

Sprite Editor/Animator: With this you may build your own custom sprites.

The screen display is broken into three main areas. The work area, which takes up the majority of the screen, displays a grid upon which an enlarged version of your sprite is displayed.

Three other programs are included.

Display Picture allows you to view colour or B/W pictures and modify the border, foreground and background colours.

Follow Me is a ankle biters' special, which serves little more than to provide a sure fire test that the light pen does indeed work with colours.

Four Seasons displays a serene forest view complete with flowing waterfall, and then provides a look at the effects of the four seasons upon the surroundings.

At around $399.00 *Flexidraw* is not the sort of package you buy on the spur of the moment.

The documentation is particularly excellent.

If you can justify the outlay, *Flexidraw* is a purchase you won't regret. Distributed by Computermate Phone: (02) 457 8118

Don't miss out on these great bargains!

Australian Commodore Review Disk Mags Nos 1 to 7

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Music

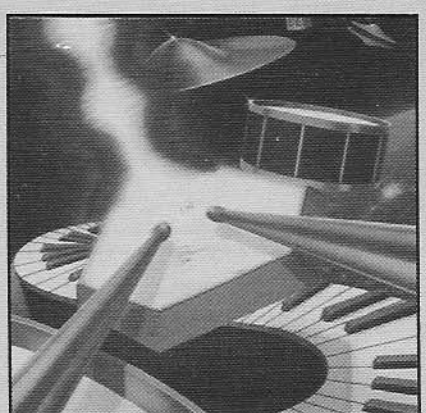
The SID chip on the C64 allows us to have three voices of music and many fine programs have been written to exploit this great feature.

We've published in-depth reviews of some of this software in previous issues of *Australian Commodore and Amiga Review* but we felt that a "round-up" of this type of software would fit in nicely in this Annual.

Music software seems to be divided into two categories: one is for serious musical programming and the other is more of a "fun" thing to play back, for your listening and dancing pleasure, music already created and stored on disk.

I've seen much good software in the first category and I guess I'd have to start by mentioning the *Music Processor* from Sight & Sound Inc. This is a lovely program which has a very easy music input system, a great range of voices and preset sounds and lets you print the "code" (although not actual music) to check over your work as you're doing it. I think this was the first music program I got into seriously on the 64 as, being a working musician myself, I wanted to combine my two main interests and I was able to do so using the *Music Processor*.

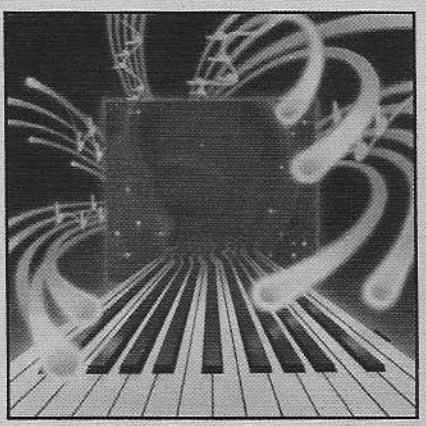
From the same stable comes a program called the *Music Video Kit* which kind of falls into the second category in that it lets you make a video with animated characters and your choice of story line etc using music supplied with *MVK* or you may use music you've created yourself on the *Music Processor*. I liked that one a lot and made a few videos for my family's amusement.



Kawasaki Rhythm Rocker

Electronic Arts publishes the *Music Construction Set* which has some magnificent music already stored on disk for you to just play back and listen to or you create your own using the joystick to point at various icons (was this one of the first 64 programs to use the icon method I wonder?). There are preset sounds available in this one also, but you may not change them, they're fixed sounds. The music sounds nice though, and that was the main aim of the program after all.

Activision's *Music Studio* is another icon-based program that uses joystick control of music entry and playback etc. A nice library is included and you can add lyrics to your songs too. There's a "novice" area in *Music Studio* which simplifies the way the music looks and which also uses colours to show the tones of the various presets. The "advanced" area uses standard notation and gives full SID access. A feature called "block move" allows you to copy music you've already created to be copied to another spot in the sequence of your music which is great for doing those repeat passages.



3001 Sound Odyssey

One program which I've been trying to get hold of (but without success) is Broderbund's *Music Shop* which I've seen in action but never worked with. It apparently has a good music printout but I can't verify that without running the program and Broderbund say that it's now discontinued and they haven't got one anywhere. A pity really, because if their *Print Shop* and *Toy Shop* programs are anything to go by then the *Music Shop* should be OK. The music I heard played back from its built-in library was of a very good quality and I'm sorry I haven't been able to work with the program so as to be able to report on it properly.

MusicCalc I is a very elaborate sequencer-type program that uses its own symbols for notation rather than standard music. I found it somewhat complicated to work with, and never really got a great deal happening with it other than producing some great sounds and playing back the (by now) mandatory built-in library of music. I also heard a demo audio cassette of music produced on *MusiCalc I* and it knocked me out.

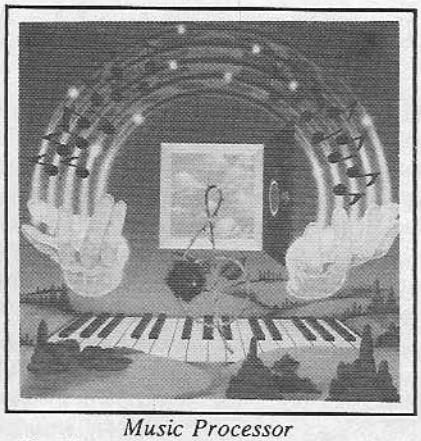
The main screen has a colourful display of a panel of sliders to control SID as well as a grid which shows the voices as they play their sequences. There's lots of presets to use or adapt, or you may design your own and save them to a data disk.

Companion program *MusiCalc II* will print out your music in standard notation on a dot matrix printer although I missed out on trying this due to an equipment breakdown so I'll have to rely on the information in the manual which says that it does. *MusiCalc III* is a giant collection of preset instrument sounds to use in conjunction with the main program.

The Japanese programmer, Rio Kawasaki (who's also a great guitar player) joined forces with Sight & Sound to produce a series of programs using the 64's features to the fullest. The *Kawasaki Synthesizer* is a two-disk program with its *Composer* software allowing you to compose, record, arrange or play live with pre-recorded one or two-voice sequences. You can save your stuff to disk with this one but not with the other disk, the *Performer*. What this one does is let you play along using over 500 presets to make three-voice music or you can be the lead player with a drums and bass sequence.

Both programs allow you to use the plastic keyboard overlay which comes with another Sight & Sound program, the *Incredible Musical Keyboard*. This is a nice, menu-driven program that lets you use the keyboard with other Sight & Sound software and shows how by way of demos using those programs.

3001 Sound Odyssey isn't a Kawasaki



Music Processor

program but is along similar lines. It has a built in synthesizer called "Microsynth", several songs in its library and around 100 preset sounds. You'll learn to change SID's parameters via a joystick-controlled panel and you may also record polyphonic (multi-voice) sequences for later playback.

Rhythm Rocker by Kawasaki (again!) is a music concept with a difference. It's a kind of palette of sounds and graphics which you control and combine in real time. A demo on the disk shows you what's what and it's quite something. *Rhythm Rocker* is really two programs running at the same time, a music program and a graphics program. The music section lets you play combinations of rhythms, play synth lead over prerecorded or self-created bass and drums or several other combinations. You may also use rhythms and bass tracks created using the *Kawasaki Synthesizer Composer* mentioned above. The graphics section has some stunning effects such as the way that multi-colour shapes are drawn automatically by the program as the music is playing. You get to create some graphics yourself by changing the way the program draws them and you may also add Expanding Colour or Rainbow effects to the built-in graphics. It's worth running these programs just to learn more about controlling the various parameters governing sounds and music.

Sight & Sound has put out several disks which definitely fall into the "listener" category. These are all called Song Albums and are listed as *On Stage, Rock Concert, Solid Gold* and *Music Video Hits*. They're mostly music performances created with the Sight & Sound programs and have some good renditions of mid-1980's pops etc.

Activision publishes a program called the *Designer's Pencil* which is quite ingenious really and has its own programming language built in so that you can program a little pencil to zip around the screen drawing things and input your own musical accompaniment to it all. A printout feature is included so that you can read your code and change it wherever necessary. This is a "first category" program where you really do get to create your own music and save it too.

A weird little game called *Moondust* still intrigues me whenever I load it up and run it. Basically you control a "seed" with your joystick and as you move it around it germinates and produces random music along with whatever score you achieved in guiding the seed around. Fascinating, but I've never fully understood it! It was very much an original concept for a Californian company called Creative Software. Definitely in the second category.

Another one which has a different concept is *Songwriter* from Scarborough Software. This is a program which lets you create your own music as well as playing its library of music. The display is reminiscent of a music box or player piano roll and the effects are quite nice. I think this one would be of more interest to young folks who like music and are keen to make some themselves via the microcomputer at home or school. Concepts taught are very sound and useful.

Firebird's *Music System* and *Advanced Music System* software have strong features for music entry with good SID control in both programs. *Music System* has three main sections: Editor, Keyboard and Synthesizer, which are used for music entry, realtime playing and setting of sound parameters respectively. *Advanced Music System* has the same three modules plus Linker, which lets you chain together several pieces of music to make a large file (chain up to 99 pieces for your own "concert"). The Printer mode lets you print out your music to Epson and compatible printers, including lyrics below the tune itself. There's also a Midi mode in AMS to let you hook up to a Keyboard such as the Casio CZ101 via a suitable Midi interface such as the Passport one. You may then enter music direct from the keyboard, which is much quicker, and you can use the Midi mode as a sequence storage device to program repeats etc and store the music to disk. Again, a nice music library is included on both *Music System* and *Advanced Music System* if you just want to play back ready-made music. Incidentally, the Synthesizer module is a good one to learn about envelopes and filters etc by changing the ADSR (Attack, Delay, Sustain and Release) parameters with the easy-to-follow controls.

I've covered other music programs in reviews over recent issues of *Australian Commodore Review* and *GEM* including *Electrosound 64* (ACR June 87) and it's a powerful sequencer/synthesizer which lets you save your finished piece to disk for later playback and also has it's own library of music.

Euphony was covered in *ACR* in July and August 87 issues and I rated it highly as it gives the 64 a similar music language to the C-128's Basic 7.0 plus a lot of other features including the ability to create, store and playback extremely long pieces such as the Bach Brandenburg Concertos complete.

Also in *ACR* in August 87 I reviewed *Virtuoso 64* which I've settled on as being the fastest music entry program I've ever seen on the 64 and which I've used a lot recently to create music files for my own use. Read through these reviews if you need more detailed information.

Obviously there'll be other music programs around that I haven't mentioned, possibly because I don't know them all, but the above should give an indication of some of what's available in this exciting field and I hope you get as much fun as I do from making music on your 64.

The Music System and *Advanced Music System* are distributed in Australia by ISD. Phone (03) 222-2288.

Sight & Sound programs (including Kawasaki programs) distributed by Ozi-Soft (02) 211-1266.

Music Studio distributed by Imagineering (02)697-8666.

Check your favourite computer shop for software where the distributor isn't listed.

Electrosound 64

This is a powerful synthesizer/sequencer/music/entry/programmable drum machine program which comes all on one disk from Orpheus Software (UK).

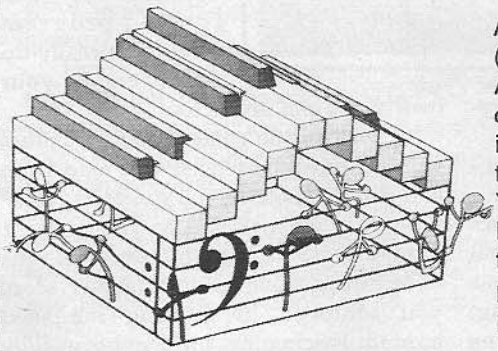
Musical compositions produced with the software can be saved to disk or tape for future replay or modification and there's an impressive music demonstration supplied with the software which ranges from classical music through funky jazz to rock'n'roll.

Electrosound 64 uses the three channels of the Commodore 64 to their best advantage and even if you've already dabbled in synthesizers, you won't be disappointed in the sounds you can produce with this software.

You can play the Synthesizer manually using the C-64 keyboard, or if you have one of those plastic keyboards (part of the Commodore Music Maker Package) that clips onto the C-64 then you're in luck because *Electrosound 64* is compatible with that too.

Incorporated into *Electrosound 64* is a programmable drum machine which you can use at the same time as the music sounds to provide drum accompaniment to your composition and give it rhythm.

There are 20 Sequences available plus 20 Tracks. A Track is made up from Sequences and can hold a maximum of 100 Sequences (very handy because most music has passages which repeat



one or more times).

The Synthesizer mode allows vast scope for experimentation and the manual takes you through the method of creating a sound by changing one of the existing sounds to unleash your creativity. A nice touch here is that there's a "write-protect" feature which you need to unlock before you're allowed to change the parameters of a sound. This, of course, prevents you from changing a sound unintentionally.

You're taken through the mysteries of Attack, Sustain, Delay and Release (known to synthesizer aficionados as ASDR), where all is explained and made clear and the author of the manual, having given you the basics of sound synthesis, encourages you to experiment! You'll learn about Ring Modulation and Filters and other mysteries if you work though the instruction manual which, surprisingly enough for something so comprehensive, is only about 30 pages long including the very helpful Command Key Charts.

ELECTROSOUND 64

RRP $65.95 From all good stockists. Distributed throughout Australia by Computermate, Phone 02-457-8518.

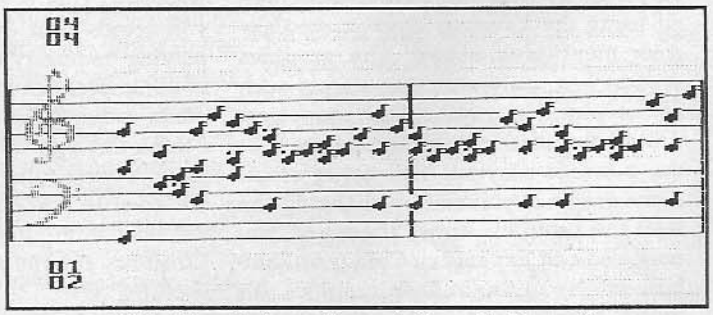
Euphony

Writing and playing of extremely long pieces of music in up to three voices is possible with this package. One of the pieces on the library disk which came with my copy of *Euphony* is the 3rd Brandenburg Concerto by J.S.Bach which runs for 11 minutes.

Written in 100% machine, the program stores the coded music as program (PRG) files. This has the advantage of allowing full-screen editing using the usual BASIC editor - as well as easy storage and retrieval using a disk drive.

You actually use the Basic Editor to do things like change line numbers, write over lines, insert & delete, and duplicate lines - just as you do in normal Basic programming. The difference is that *Euphony* puts extended commands into the memory of the Commodore 64 to allow you to enter music in a very similar manner to that used in Basic 7.0 on the Commodore C-128.

You may change the speed at which the piece is to be played, also the sound of the voices to be used by pressing "S" or "V". If you wish to change the key by transposing the entire piece, you may do so by pressing "K" and choosing the key from a sub menu. Again very handy - for musicians to be able to do this in an actual performance means first of all re-writing the entire piece on paper (which can take many hours or even days for a long piece).



Third Brandenburg Concerto Page 1. Phrase 2.

The C64 does it in seconds and *Euphony* plays the music in your new key - although the screen display still shows it in C major for convenience of layout.

To help you understand how music is entered the manual includes part of an Etude by Chopin.

The screen display shows a full music staff of Treble and Bass clefs plus several ledger lines above and below the staff.

Below this display is a 6 octave keyboard. As the music plays the notes appear on the staff and keys on the keyboard are highlighted simultaneously.

Each voice is shown as a different colour, V0 is yellow, V1 is blue whilst V2 is green.

Also shown in the screen display is the Page number and Phrase number currently being played so that you can check your code if you hear a wrong note.

The *Euphony* manual covers the rudiments of music and explains what is meant by various terms and has a handy section on "uncommon durations".

Review copy supplied by Value Soft, 3641 S.W. Evelyn Street, Portland, Oregon, USA 97219. and potential buyers could write to them at that address.

Commodore Sound Sampler

The sound sampler cartridge, with the microphone provided, allows you to take three second "sound snapshots", which can then be replayed at any pitch on your computer keyboard. The waveform can be plotted on screen, an interesting and informative feature, and the sound can be edited to some extent.

The unit can also be used as a digital "echo chamber" with variable delay time, and as a "harmoniser", or pitch converter. The "Quattro Sampler" feature allows four sounds to be recorded and replayed in sequences to produce interesting rhythm effects. To top it all off, the unit doubles as a drum machine, using predigitised drum sounds included with the program.

Software: Windows and pull down menus are again the flavour of the day, software is fairly self explanatory, and all the features can be accessed with very little need to refer to the manual.

The system is MIDI compatible, which means that a MIDI interface can be plugged into the top cartridge port allowing the Sampler to be controlled by a MIDI equipped synthesizer. This is most unfair if you have just bought the Commodore Piano-style keyboard and expect to be able to use it with the Sampler as well as the Sound Expander. You can't. However, if you already have a Midi style synthesizer, this feature is a real boon.

Conclusions: This system works well, and is easy to get going. Besides that, it's lots of fun.

Being limited to playing back sounds on the old 'QWERTY' does put a bit of a damper on my enthusiasm, because there's no way that you could ever really use the system in a performance without a proper keyboard.

However, professional MIDI equipped musicians should take a good look at this system as an inexpensive means of getting into the world of digitised sound.

Distributed by: Commodore Business Machines R.R.P. $180.

Music Glossary

Bar : A measure, made up of bar lines, upon which musical notes are placed to determine their pitch and duration.

Clef : Identifier showing the convention used in which the music was written in. Example:- "Treble Cleff ", "Bas Clef".

Crotchet : A note of one beat in duration. Depicted by a solid circle.

Duration : The length or time for which a note is played.

Envelope : In a synthesizor, the shape of a sound or instrument, is defined by breaking the sound into various parts. These include the Attack, Decay. Sustain and Release. Each part of the envelope lasts for a certain time period. For example a guitar has a very fast Attack rate, with very gradual release.

Filter : To make certain sounds appear louder than others, a filter is used in synthesizers. Sometimes called attenuating. The 64's SID chip is fitted with three filters: A low-pass, high-pass and band-pass.

Frequency : The rate at which a waveform is produced. The faster the frequency, the higher the resulting pitch of the note.

Octave : The gap between each complete range of note is one octave.
Pitch : Where the note lies in the musical "scale".

Quaver : Half the length of a crotchet, a quaver has a little tail on it's leg.
Register : The SID chip contains a variety of memory locations called registers. These control the characteristics of the sounds produced, and are like the knobs on an electric piano.

SID : Sound Interface Device. The silicon chip in the Commodore 64 that produces all music and sound. It has three voices, and is capable of nine octaves.

Staff : The five lines upon which the music is written.

Time Signature : Number of beats per bar, all notes must add up to this value.

Voice : A single channel though which a sound may be synthesized in the SID chip.

Volume : The power or strength of sound.

Waveform : Different instruments have a different timbre, since the notes although of the same value are produced differently. A synthesizer can replicate waveforms, which in turn produce the same effect. Some waveforms are sine, triangle and square.

Personal Publishing

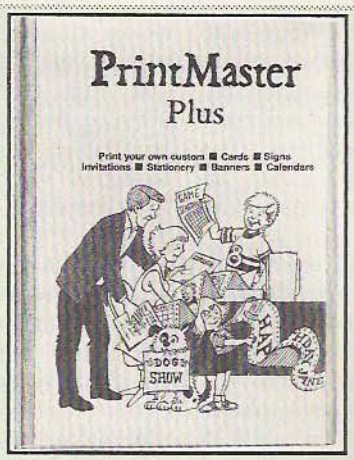
Since I first got involved with Commodore microcomputers I've seen an enormous upsurge of interest in programs that actually "do something", particularly with a printer hooked up and in fact one of the first programs I bought when I got the Gemini 10X to go with my 64 was the *Print Shop* from Broderbund.

This has done much work over the past two to three years by way of producing greetings cards, banners, signs, personal stationery etc, and the useful inclusion of fonts, borders and graphics have ensured it's lasting popularity with me and millions of other users. Extra graphics disks appear quite regularly and we can now choose a picture/border/font to suit almost any occasion thanks to this fine program and its recently-introduced mate, the *Print Shop Companion*.

Another good piece of software, along very similar lines, is *Printmaster* from Unison World. This has much in common with *Print Shop* and is a valued addition to my library also. Both programs let you make calendars with special graphics and/or text to mark special days and have pleasing results when printed on one of the bewildering array of printers supported by both programs.

There's a Public Domain program around (I think it was on one of the *Australian Commodore Review* disks recently) which performs conversions of the graphics used by both programs to make them interchangeable. Your graphics library can be further built upon by use of the Graphic Editor available within both *Print Shop* and *Print Master* (is there a Print Person for Women's Libbers I wonder?) and you can also get the *Graphics Expander* to use in modifying existing graphics or in creating your very own.

If you want to publish a newspaper or newsletter for school, club or office etc you can do so with the *Newsroom*, a very good personal publishing package for the C64 from Springboard, who also publish the *Graphics Expander* mentioned above. This lets you create a "banner" for a headline, a "photo" using one or more graphics from the extensive in-built library, then add your text in a variety of fonts. Again, you may even create your own graphics by using the drawing "tools" available from the screen menu.



Banners and photos etc may be saved on a data disk for future use, very handy if you're doing a monthly newsletter with the same heading each time.

Another great piece of software which has just arrived on the Australian scene is *Stop Press*, which really does bring desktop publishing to the good old 64. This one has the lot! Columns of print, automatic flow around graphics, fonts and much more. I never thought I'd see the day when the 64 could be made to do so much.

Also from Springboard comes *Certificate Maker* which allows you to make a personalised certificate to reward a student, acknowledge an achievement or simply have fun by sending a humorous certificate to a friend, colleague or relative. Over 300 certificates are included on the original program disks and the subsequent data disks with such available things as: Mr Fixit Award, Practice Makes Perfect Award, Class Act Award, Worst Joke Award etc.

These certificates are already programmed and all you need to do is add the recipient's name and perhaps a short message plus the date. This is a terrific program for school use as most young people respond well to acknowledgement for effort and more mature people too if it's done nicely, say with a humorous certificate with a meaningful message.

The Toy Shop from Broderbund is a fabulous piece of software which actually prints out the component parts for 20 different working models such as: Antique Truck, Steam Engine (powered by a deflating balloon), Oil Pump (powered by the Steam Engine), Jet Dragster and others. The printing detail is quite staggering and can be customised to include your own name or perhaps your company name. You can personalise some of the available graphics too and the resulting toys are of superb quality.

I've always rated this as one of the best programs ever written for 64 and I know it'll give untold hours of fun to young and old alike.

Talking of fun, you Garfield fans out there can get *Create with Garfield*, the De Luxe version of which is now available and which lets you create cartoons using all of your favourite characters from the cartoon strip to make funny cartoons to be printed on paper or made into a moving slide show which runs independently of the main program once created.

Again you have font choices in various sizes and can even print labels to suit school books with this nice program.

A companion to this one is *Teddy Bear-Rels of Fun* which does very similar things but using a large library of teddy bear figures. I discovered when first using these two programs that the graphics are interchangeable and you can make pictures and slide shows using both Garfield characters and teddy bears with some very funny results. Great stuff!

No discussion of productivity software would be complete without a mention of Koala pictures and Doodle pictures. Both of these formats have been discussed many times before so I won't rehash all of that, but I will mention the trio of programs from Solutions Unlimited in the USA. These are of course: *Billboard Maker*, *Icon Factory* and *Photo Finish*. They all do marvellous things with graphics and among their many fine features are the ability to change a

picture from one format to another (say Koala to Doodle), shrink or enlarge the picture, smooth out the curves using the amazing Optimizer, print your finished picture in different shadings (the grey scale) and much, much more. Unfortunately, I don't know if there's an Australian distributor but the company is heavily advertised in the American magazines so you could write to them if necessary.

The Cockroach Graphics Utility (formerly *Graphics Pirate*) has much to offer in this area also. It allows you to "capture" a picture and save it to disk for later modification and printing, again on a variety of printers. There are very useful utilities with this package that allow the transfer between formats (*Koala, Doodle, Newsroom, Print Shop* etc etc) to let you use captured pictures in your printouts using either its own facilities or those of some other programs.

Furthermore, this excellent package allows you to make a slide show of your pictures, setting your own display times and with your choice of screen blanking between pictures or not. This is great for displays in schools or stores and because of Cockroach's own invention of CCG files (Cockroach Compressed Graphics) you can put a whole lot of piccies on one disk and still get the highest quality reproduction.

Another program for transferring between formats is *Photocopy* which comes from Megasoft in the USA. This one lets you change between all the well-known formats as well as converting "photos" from *Newsroom* for use in other packages. Local distributor is Computermate of Mount Kuring-Gai and they'd be able to answer queries on some of the other items mentioned also.

This same distributor brings us a trio of programs called *CardWare, HeartWare* and *PartyWare*.

The first one makes animated musical Birthday Greetings and "prints greetings cards for all occassions". You may print out a full-page graphic personalized with your message, a folded card with a graphic on the outside and your personal greeting inside or create a disk greeting to send to other computer "freaks" for special occassions.

HeartWare has similar features but this time it makes animated Friendship greetings (with music) and Love Notes folded like the *Card Maker* ones. Again you may make up a greetings disk with the special features of *HeartWare* on it to send to friends to load and run.

The third one in the trio is *PartyWare* which is billed as a "Party Design Kit". There's a database facility to let you log names and addresses of friends along with their own birthdays for reminders etc. You may then select a guest list and print out invitations to send out to them all.

HeartWare also makes all other paper items for your party including: banners, placemats, place cards, thank you notes, party hats, games, prizes etc. Print cards for all occasions with this one too as well as making up animated disks to send special invitations, greetings and messages to your "hi-tech" friends. Every item may be personalized using *Heart Ware* and it'll print a party "checklist" so that you won't forget anything.

All in all this is a very useful set of programs and all three together won't break the bank.

There's another animated greetings maker in the *Fireworks Construction Kit*. This lets you choose from a variety of fireworks to display, then include your message and put a musical background to it. Nice effects, enhanced even further by the fact that *Music Studio* files are compatible and may be used as a "soundtrack" to your personalised greeting. I don't know who the local distributor is on this one either. Sorry.

The Geos (Graphic Environment Operating System) has much to offer in the field of Personal Publishing. *GeoWrite* is an easy-to-use word processor whilst *GeoPaint* is a complete graphics program. It gives you the capability to incorporate graphics from other formats into your Geos documents by way of its Graphics Grabber as it can convert *Newsroom, Print Shop* & *Printmaster* graphics to *GeoPaint* format ready to be used with the *Geos Writer*'s Workshop. This really turns your 64 into a publishing factory.

There's a font library with 20 additional fonts called, appropriately enough, Font Pack 1 which lets you style your text nicely and by using GeoFile or GeoDex you can build up a database of names and addresses to use as a mailing list base.

There are thousands of happy Geos users who get much productivity from their 64 systems with the various programs made available by Berkeley Softworks to run under this outstanding operating system.

Personal Publishing and/or Productivity Software is a very exciting field and there will obviously be omissions in my little discussion on the subject. New programs seem to appear each month, some outstanding, some which fade as quickly as they appear, but the ones I've mentioned are the ones I've either used personally or have had strong connections with. Have a look at them all if you can, I'm sure you won't be disappointed.

Where the Australian distributor isn't shown your favourite computer shop may be able to help, but for the following programs you could inquire from the distributor listed to find your nearest stockist.

Print Shop, Print Shop Companion, Printmaster, Photocopy, CardWare, PartyWare, HeartWare, Cockroach Graphics Utility, Stop Press etc.: from Computermate Products, (02) 457-8518.

Newsroom, Certificate Maker, Graphics Expander, Create with Garfield (De Luxe), Teddy Bear-Rels of Fun etc.: from Dataflow Computer Services, (02) 331-6153.

Geos: from Commodore Australia, (02)427-4888.

Toy Shop: from Imagineering (02) 697-8666.

Graphics Pirate/Utility: Cockroach Software (075) 324-028.

Cardware, Heatwave, Partyware and *Stop Press* from Computermate (02) 457 8518.

Teddy Bear-Rels of Fun

"for people of all ages"

This software lets you create pictures of Teddy Bears in a variety of situations using props, backgrounds and settings in a sort of "mix and match" style, then add text to the picture either as a "speech balloon" in cartoon fashion or as a caption to the picture. Having done all this you then have the option to print the picture in several different ways: half-page picture, full-page picture, 4-page poster (you paste the pages together to form the poster) or as a standard 4" sticky label which takes the bottom half of the picture to make the label. They're good printouts and the program supports a range of popular printers.

It's a two-disk set, the second disk being a data-library of extra Teddy Bears and "clip-art" bits and pieces and the two disks together give a huge range of options.

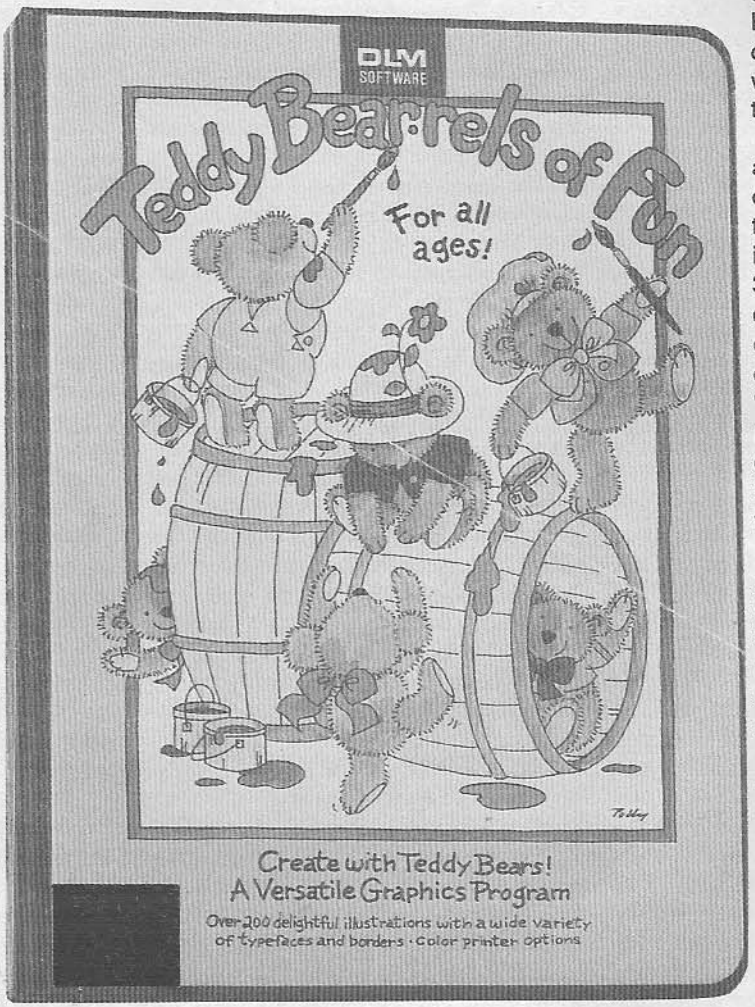
The various Teddy Bears, props and other bits of clip-art are selected from actual pictures rather than descriptions, so you see exactly what you're adding to your picture.

The software is menu-driven and can be operated almost without reference to the manual when setting up the various options, although you'll use the last chapter a lot when setting up your pictures.

An especially nice touch is the facility to make what they call "an Electronic Show" which is an automatic slide-show displaying up to ten of your pictures in a sideways scrolling sequence.

One of the examples in the manual shows a boatload of Teddy Bears dressed as pirates with the lookout bear saying in a speech balloon "There's land ahead, Captain" and a story-line caption at the bottom of the picture saying "The sailing bears were all at sea one sunny day, when all of a sudden . . . " This looks like a great opening shot for another nine pictures of a pirate tale which the kids would enjoy.

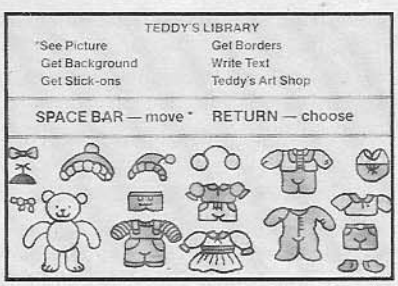
On top of all this you can make your own Special Artwork with a Koala Pad and save it to your data disk, to be loaded in when required and used with the existing artwork.

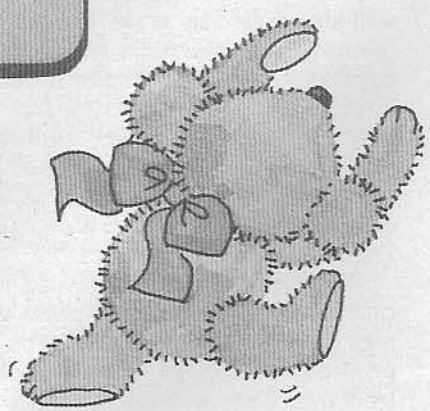


As there are over 200 separate pieces of art, plus borders and a variety of fonts, there's tremendous scope for invention and creativity. Over 30 printers are supported, including the latest colour printers. Your printouts can be done either "filled in" or in "outline" only. This latter facility is great for making your own colouring-in books, handy for youngsters on those rainy days!

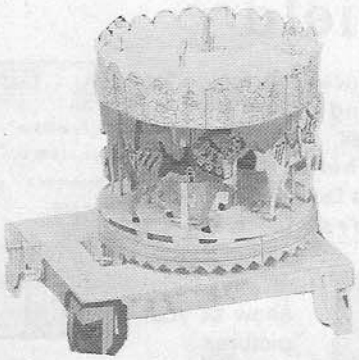
All in all it's a good-value program for almost any age-group and is available for the Commodore 64 at $62.31 ($54.95 excluding tax where applicable) from good stockists everywhere.

Distributed by: Dataflow Computer Services Ph:331-6513 $62.31 (inc. tax)





The Toy Shop



This is a very clever 3-disk package that turns your home computer into a full-scale factory which produces components for a range of 20 "kit-set" toys for you to assemble and paint.

Included in the impressive list of toys are: A 1910 model Truck which can have either a flat bed or a van body, a Jet Plane finely-balanced on a pin-point and which twists and turns when set in motion (this is a terrific executive desk-top toy by the way). There's a medieval Catapult which will lob a jellybean right across the room (or a paperclip across the office), a Glider that really flies, a Carousel with four beautiful prancing horses, a Dragster which is powered by air from an inflated balloon and much, much more. A detailed list of the various models is included further in this review.

You can change the "decal"or graphic emblem which is to be printed on your model with a very good graphic editor (how about putting your own company logo on the Antique Truck doors for instance?) plus a really nice feature in that you can use a graphic from Broderbund's *Print Shop* as a decal so the possiblities for personalization there are endless.

The Toy Shop package contains all you need to get started making models right away, and includes wooden rods and lengths of wire for axles etc, balloons for powering various models, cotton cord and a large number of cardboard sheets which are adhesive-backed.

The manual for this outstanding piece of software is a lesson in how to write an instruction book. It's very easy to read and at the same time it's most thorough and comprehensive. You're taken right through every step of the job, from loading a model from disk, customising it, printing it out, then assembling the finished job.

The Toy Shop is great family idea and you could make it a team effort to produce a particular model or even have several different ones "on the go" at once with everyone involved.

The price is a little higher than some single-disk programs, but don't forget that you get 3 disks with this one, plus all the cardboard and wire etc. Furthermore, if you have a look in the hobby shops you'll see that you can pay from $20 to over $150 for just one model-kit depending on size etc.

A refill pack of component materials is available from your software supplier and costs around $69.

System requirements: Commodore 64 or 128, disk drive and printer (suitably interfaced). Check the pack for list of printers applicable.

Retail price is around $125 from good stockists everywhere.

Distributed by Imagineering, (02) 697 8666.

Certificate Maker

Certificate Maker and *Certificate Library Volume 1* are produced by the very American company Springboard, and distributed in Australia by Dataflow. These are the companies that brought you such classics as *The Newsroom* and *Newsroom Pro*. *Certificate Maker* is very similar in style to these programs and is also similar in presentation quality.

Certificate Maker is aimed squarely at the "Any fries with your Big Mac, sir? Have a nice day, sir" mentality. The "Golden Arches Syndrome". But then again, everyone loves going to McDonalds, so I may have to eat my words. With a sesame seed bun and special sauce, thanks.

The brochure tells us that *Certificate Maker* provides over 200 awards and certificates to "recognise, reward and encourage all kinds of achievement. It's perfect for use in schools, clubs, businesses, civic groups or at home".

It's hard to know which I find the more distasteful ... the corny comedy certificates, or the supposedly serious recognitions of achievement. What this package does is to cheapen the whole idea of Award Certificates. The whole deal becomes so gushy and overdone that every day becomes "Academy Award Day". The whole idea of being awarded a certificate lies in the fact that it is a rarity. In the good old days they were beautifully printed, with goldleaf or red wax seals. Stylish. Now they just churn on out the end of your dot matrix printer.

Can I find anything positive to say about this milestone in Personal Publishing? Yes. In fact I am forced to admit that the whole package is put together extremely well.

It's easy to use, there are plenty of preconfigured printer and interface files, and getting started is a snack. The graphics are absolutely fantastic. They leave *Printshop* for dead. The fine detail and use of shading in the illustrations is brilliant. The border designs are excellent too. The main program (a two disk set) provides 24 borders, while the companion *Certificate Maker Library* provides another 24. Again, the fine detail is most impressive.

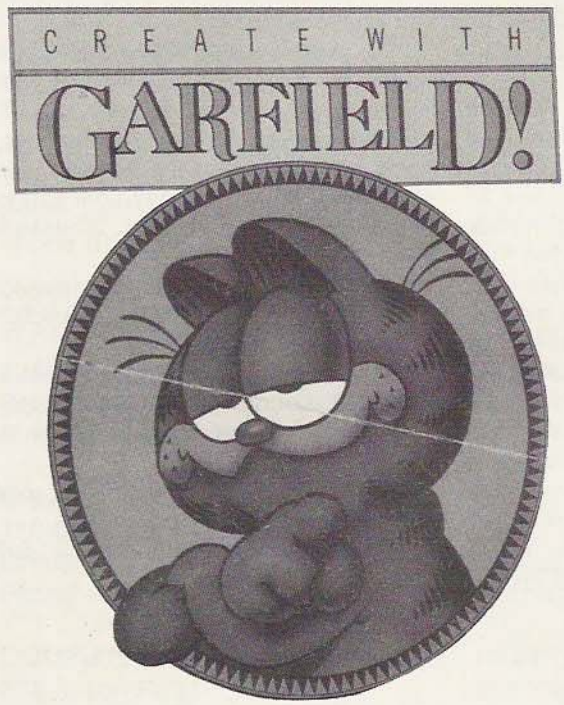
Certificate Maker is a well designed and well executed program. The program shows that there is a definite culture gap between here and the USA. The humorous ones are incredibly corny, and the serious ones so cheapen the idea of recognising and rewarding merit that the whole procedure becomes insulting. Feel free to disagree, but *Certificate Maker* just isn't my style.

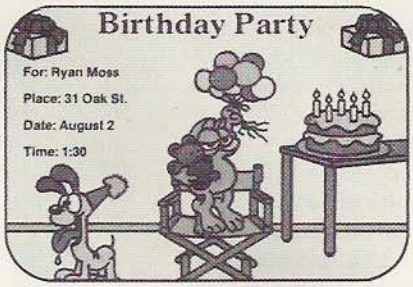
Distributed by: Dataflow Computer Services (02) 331 6153
$90.66 (inc. tax)

Create with Garfield

Basically, this is a program to create and print posters, pictures, stickers, labels etc. for printing on a variety of printers including colour printers. It offers over 200 pieces of artwork, including borders, and has several typefaces (or fonts) for writing captions or stories.

There's also the same facility as in *Teddy Bears* to make a continuously moving slide-show of your pictures which then scroll sideways across the screen and which is great for making your own comic cartoons and stories.





Garfield can have his friends with him in the pictures, including Odie and Jon, and there's a good selection of 'poses' available of all the characters. There's also a set of pre-programmed captions within this program, or of course you can make up your own.

My only gripe with the Garfield printouts was the fact that it puts a credit line in small print at the bottom of the picture saying 'C. United Feature Syndicate 1978' and I didn't think that they should claim copyright on something which I'd just created!

If you're a Garfield fan (and who isn't?) then you'll like this one as much as the Teddy Bears, so why not add both programs to your software library?

Available for Commodore 64 at RRP $62.31 ($54.95 excluding tax where applicable) at good stockists everywhere.

CREATE WITH GARFIELD! Deluxe Edition is distributed in Australia by: Dataflow Computer Services, 134 Barcom Avenue, Rushcutters Bay, NSW 2011 Telephone: (02) 331-6153. $62.31 (inc. tax)

Personal Publishing Glossary

Character : An individual letter, number or special symbol is known as a character. A character is formed both on the screen and printer by a series of dots placed in a matrix.

Clip-Art : Small pictures, or even parts of large pictures, that can be included in your designs are known as clip-art. Using a cut and paste function, pictures can be included in posters, banners, or newsletters with a minimum of fuss.

Cut : Allows you to remove a portion of text, or graphics for pasting else where, or to be discarded all together.

Font : A character set, of one particular size and style is known as a font. Fonts are normally named. Some example are Times, Deville, and Avant Garde

Justification : Text or graphics can be aligned relative to the left and right borders of the page. Text aligned down the left border is left justified. If you have left and right justification on, your text should turn out much the same as a column in this magazine.

Margin : The gap left around the border of your page is known as the margin. Margins also appear between columns of text.

Paste : The process of putting text or graphics onto the page. Before you paste you'll need to cut.

Text : Words, letters or characters, go to make up text. Everything that's not the pictures, lines or borders is text.

Typeface : see font

WOTSIPOP : What's On The Screen Is Printed On Paper (Coined by Phil Campbell). All text and graphics is displayed on the screen as you would see it when printed.

WYSIWIG : What You See Is What You Get. (In popular use in the desktop publishing world.) Same as WATSIPOP, only trickier to pronounce.

Printers

Having purchased computer, disk drive and software, a printer is the next logical addition. With it you can obtain that invaluable hard copy of your work. Letters, documents, mail-outs, graphics, charts and diagrams can be printed using day-to-day programs.

More specialised software in the personal publishing bracket enables you to produce letter-heads, posters, signs postcards and banners.

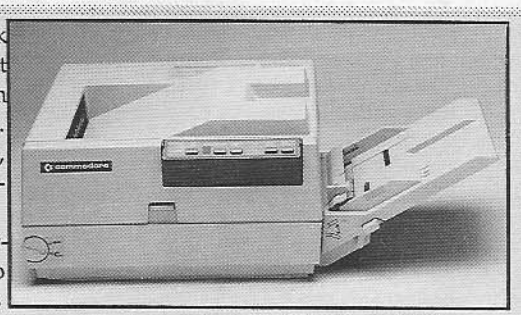
On the Commodore 64 there are a variety of ways to connect a printer. Which method you choose will decide what level of compatibility is maintained. Certain ways and means, whilst cheaper, may offer less future potential or work with fewer software programs.

Most programs expect a standard Commodore type printer connected to the serial port. Once you have a disk drive, the printer will connect to the serial port on it.

However, a vast number of programs will also cater for non-Commodore type printers conforming to the Epson or similar standard. These may be connected via a special interface, or through a direct cable to the user port.

If you plan on sticking with computers for any length of time, and you can afford a Centronics printer, then that is normally the best way to go. (A Centronics printer will require an interface, whether or not it is produced by Commodore). Budgets that preclude such expenditure are best directed toward the second-hand market, or the low end of Commodore's own printer range.

Commodore recently upgraded their printer range to include some very fine machines. These are actually rebadged versions of the OKI- Microline range. Before looking at the individual models available, let's take a brief look at a few general areas of printers.



Commodore LP 806 Laser Printer

Getting ink to paper

Most popular is the dot-matrix printer. Characters, or letters and numbers are formed by a series of dots placed close together. The result can vary from barely readable to virtually perfect letters.

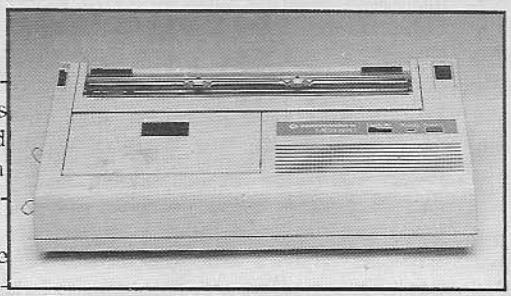
Most users will be familiar with the quality produced by a daisy-wheel printer. Not unlike your average typewriter, this device produces each letter by stamping the required character against a carbon ribbon. An imprint is then made on the page that is well formed. Daisy-wheels, or golf-balls, may be interchanged to provide a variety of typefaces.

In practice this method produces what is referred to as letter-quality typewriting. Some dot-matrix printers are able to come close to this quality by overlapping the dots, and doing a double pass over each letter. The resulting characters are called near-letter quality.

Various other forms of printing have come and gone over past years. These include thermal printing which burnt the letters onto special paper. The cost of paper was far too expensive, and it tended to deteriorate with age.

Ink-Jet printers are another alternative. These are very quiet, very fast but rather expensive. Ink is literally propelled onto the page, and each dot goes to form a letter in much the same way as a dot- matrix printer.

The latest development is the Laser Printer. These are based on the design of a photo-copier. They work by etching the design of each character or dot onto a drum which then prints the entire page in one fell swoop. Quality is excellent, especially with use of a page description language such as Post Script.



Commodore MCS 810/820 Colour Series

This language enables each character to be perfectly drawn by the laser.

The result is close to typesetting quality. Thus many publishing houses use laser printing to save typesetting costs and speed up production time. This very publication was produced using an Apple LaserWriter.

Which printer do I need?

For home use, a dot-matrix printer is the most flexible and least expensive choice. Because of the way in which each character is formed, a similar process may be used for creating graphics output. Daisy wheel printers are confined to the available type-faces. However, the quality of output is higher. Thus, they're more suited to the business environment.

The process of printing graphics is often referred to as a high-resolution screen dump. In this operation each dot displayed on the screen in a bit-mapped display is printed on the printer correspondingly.

More expensive dot-matrix printers work faster. The speed is normally expressed as characters per second. Around 80 CPS is average, with many brands now arriving with 120 CPS standard. In low-quality draft modes a few will even reach as high as 300 CPS.

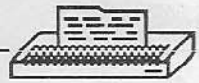
Daisy-wheel printers are inherently slow, due to the larger number of moving parts. They vary from 30 CPS to 90 CPS on ultra-expensive models.

Several printers available will handle colour. Since the Commodore 64 is a colour computer, this may seem a logical choice. However, in practice colour printing tends to have little day to day use. It is possible to print onto special plastic suitable for overhead transparencies. Colour business reports also attract some buyers. For the hobbyist, a few smaller models will produce excellent reproductions of screen pictures. However, day to day use of these units is limited.

So what are the choices?

Commodore offer six different models, all suited to various computers in their product range. Please refer to specifications charts listed.

We also review in this section the Star NX-10 and the Olympia NP30.



Printer Glossary

Buffer : Many printers have a buffer. This is like a pool where data is sent before being printed. Since information can go to the printer faster than the printer can actually print, the buffer frees up the computer sooner.

Dip Switches : A small row of switches which control special functions. Normally located inside the printer, or on the rear panel.

Form Feed : A complete page or form of paper may be fed through the printer by pressing the form feed button. The same effect can be produced by sending a special control character to the printer via software. The form feeds only feed to the top of the next form, set using the top of form button.

Friction Feed : Paper is gripped behind a large roller, and held there by friction as the roller turns, feeding the paper past the print-head.

Line-Feed : The paper is fed through the printer a single line. Produced by pressing the line-feed button or by sending a special character from software.

Margins: You indicate the width of these margins by specifying the number of characters from the left-hand edge of the paper. Some programs refer to the left margin as the binding allowance - a space provide for hole punches, or staples.

NLQ : Near Letter Quality - Dot matrix output that is so good that it resembles daisy-wheel quality print.

On-Line : Sometimes called Select, this button readies the printer to print information. Until this is done, you are able to carry out form or line feed to adjust the paper position.

Paper Size: A variety of paper sizes exist, with some word processors allowing you to choose between the various choices. These include :-US Letter (8-1/2 inches wide, 11 inches tall), US Legal (8-1/2 inches wide, 14 inches tall), Narrow Tractor (9-1/2 inches wide, 11 inches tall) and Wide Tractor (14-7/8 inches wide, 11 inches tall). Basically, representing varying sizes from A4 singles to continuous feed paper.

Paper Type: Select Fanfold if you're using continuous-feed paper. Select single if you're printing on individual sheets. For faster but lower- quality printing, select Draft. For higher-quality printing, select Letter.

Parallel Port: The Commodore 64 does not have a parallel port. However, there are several ways of simulating one, or adding one. The user port may be configured as a parallel port. All that is required is a special cable, costing around $50, and the right software driver.

A parallel driver program is available on issue three of the *Australian Commodore Review* Disk Magazine. Most good wordprocessors have the necessary software built in to make use of such a cable. However, for listing programs, you will need a stand alone version.

The Parallel port generally links you up with the printer or other colour plotter, (a specialty device for drawing high-quality graphics. It is called a parallel port because it uses parallel transmission to communicate with other devices.)

Parallel transmission involves sending eight or more signals down the cord at the same time. It requires that you give it a cable with numerous wires and in turn enhances the speed.

Print-Head : This is the electro-mechanical device that does all the hard work. A print head will contain a certain number of pins, using which each character is produced.

Proportional : Each character is printed according to its exact size, rather than giving every character the same amount of space. For example the letter 'i' would only take up half the amount of space as the letter 'o'. Rather than leaving a gap between the two letters, the letter 'o' is printed proportionally sooner, to make up for the gap.

Ribbon : Most printers use a ribbon, contained in a cartridge, to provide ink for the print head. Ribbons come in many shapes and sizes, most of which simply clip into place just behind the print-head.

Serial: Some printers and most modems use serial transmission and this port handles them. On your Commodore 64 there is not a true serial port. The USER port, once again, can be configured to act as a serial port.

The main problem is the non-standard voltage levels used by Commodore and the size and type of the user port connector. By adding a small interface, the voltage levels can be brought up from 5 volts to the standard 12 volts used in serial communications.

A printer or modem of standard nature can then easily be interfaced. Some care must be taken over the necessary wiring arrangement in the serial cable, as some modems and most printers need some sort of special handshaking.

Serial transmission is the opposite of parallel. It entails sending signals one at a time through a single wire.

The industry has standardized serial signals and a common protocol is the recommended Standard 232 or Rs-232, which you will see very often.

Spacing: This lets you select how closely lines are printed on the page. LPI is lines per inch. It is preferable to select either 6 or 8 lines per inch.

Thickness : A small lever just near the print head allows the distance from the head to the roller to be varied. This is useful for different thicknesses of paper, and for squeezing that last drop of ink out of your ribbon.

Tractor Feed : Paper is fed beneath the roller, and past the print-head by sprockets which clip into holes on the side of each page. This method is normally only used for continuous feed stationary. Normally the strips with the holes may be removed by perforations provided. More recently these perforations have been made using a laser, with the end result being a very fine, barely noticeable tear.

Type-Face : A character set used to print with may have particular style, slant and/or size. This is described as the font or typeface.

Printer Utilities

Printer utilities are invaluable. In my search for one I found not only a printer utility, but a whole suite of very useful programs. The package is the **Cardco Super Printer Utility Disk**. It sells for around $69.95, and is available from Compushack stores and most other OziSoft dealers.

It will do hi-res screen dumps for the 1525, MPS-901 and any other printer properly interfaced using a Cardco-G+ interface. There's also software to do banners and posters. A utility for a 24 Kilobyte printer buffer - within the actual computer, a real boon for long program listings. Another program will give your 1525 or MPS-801 true lower case with descenders.

A simple wordprocessor, mailing list, calculator and index program are included. There's a doodler and a very useful cross reference program. This is excellent for long programs. It will produce a complete table of all variables used, Goto, Gosub, PEEK and POKE statements and more. Great for keeping track of what's going on.

A few other smaller utilities do things such as ASCII conversion, to and from CBM to standard ASCII. There's also 20 digitised hires pictures for you to print out. All in all about 50 programs. Sounds like good value for money - an ideal utility if you have a Cardco-G+ interface.

MPS 2020

Most of you readers would by now have seen the results of the little MCS 810/820 colour printer. Some I have spoken to have expressed delight with its capabilities, and still others have been disappointed at the "gloss" finish. I don't believe however, that you can fault the price.

As far as the MPS 2020 (ML 292) is concerned it cannot be compared to its little sister other than the fact that they are both colour.

The machine itself retails for around $1,300 which is more than reasonable for a printer that does 100 cps in NLQ and 300 cps in draft or utility mode as well as colour. The black ribbon has a life of around 3 million characters and the colour ribbon, consisting of four lines - black, yellow, red and blue - has an expected life of 1.1 million characters. When you print a picture it *mixes* up to fourteen colours to get the desired effect.

A menu select mode that is operated by pressing various combinations of the front switches i.e. TOF, LF, FF and Select, lets you choose the typeface you want, character and line spacing, and other functions too numerous to mention. And the 'personality module' system that is now being employed by the more advanced printer manufacturers makes for easy computer configuration.

The printhead is also a feature that is found in the more expensive competition. When I had a peek under the 'hood' I found a dual 9 pin head. The 18 pin head is compatible with software that calls on both 9 or 18 dots.

But how did it print - can I hear you say? In a word, excellent. The printer works well in a normal office environment, reasonably quiet at 57db with either tractor feed or a cut sheet feeder option. The NQL feature is, in my mind, good enough for business letters to your bank manager, and the colour graphs produced on a letterhead are certainly impressive.

The MPS 2020 requires an interface to print from a C64.
Distributed by Commodore
R.R.P. $1,299

PRINTER COMPATIBILITY CHART

CPU TYPE	MPS 1250	DPS 1101	MCS·810	MCS 820	MPS 1280	MPS 2020	LP 806
64	YES	YES	YES	NO	NO	NO	NO
128	YES	YES	YES	NO	NO	NO	NO
128D	YES	YES	YES	NO	NO	NO	NO
Amiga 500	YES	NO	NO	YES	YES	YES	YES
Amiga 1000	YES	NO	NO	YES	YES	YES	YES
Amiga 2000	YES	NO	NO	YES	YES	YES	YES
PC 5	YES	NO	NO	YES	YES	YES	YES
PC 10	YES	NO	NO	YES	YES	YES	YES
PC 20	YES	NO	NO	YES	YES	YES	YES
PC 40	YES	NO	NO	YES	YES	YES	YES

N.B. Parallel connecting cables are not supplied with printers but are available as options.

Commodore MPS 1250 Printer

GENERAL DESCRIPTION

The MPS 1250 is a high performance NLQ (Near Letter Quality) dot matrix printer for Commodore owners seeking to produce top quality documents. With its variety of print styles the MPS 1250 enables your output to clearly stand out. Create and print your own symbols or characters with its user-definable characters. It can even handle high resolution graphics for charts, diagrams and illustrations.

SPECIFICATIONS

Printing System
- Bi-directional impact dot matrix
- 9-Pin print head

Printing Speed
- Draft quality: 120 CPS
- Near Letter Quality: 24 CPS

Character Matrix
- Standard: 9 x 9 dot matrix
- NLQ: 17 x 17
- Doublestrike: 9 x 9
- Emphasized: 9 x 10
- Expanded: 9 x 19
- Graphic Characters & symbols 8 x 9

Print Types and Styles
- Pica, Elite, Compressed, Expanded, Italics, Double Strike, Empasized, Superscipt & Subscript, Reverse, Proportional

Character Spacing
- 5, 6, 8.5, 10, 12, 17 or 20 CPI

Line Spacing
- Standard: 1/6, 1/8 or 7/72 inch Programmable

Paper Type and Feed
- Friction Feed: Single sheet up to 25.4cm wide
- Tractor Feed: 7.7cm to 25.4cm wide
- Paper Thickness not to exceed 0.03cm
- Tractor feed assembly included

Interface
- Dual Commodore Serial Bus and Parallel ports

Dimensions
- Height: 90mm
- Width: 402mm
- Depth: 255mm

Weight
- Aproximately 3.7kgs

Power
- 240Volts at 50Htz at 0.4A

Optional and Replacement Items

250022 Replacement Ribbon
601102 Replacement serial cable
250030 Optional Amiga 1000 parallel cable
250031 Optional Amiga 500, 2000 and PC range parallel cable

RRP $525

Commodore DPS 1101 Printer

GENERAL DESCRIPTION

The DPS 1101 is a high quality daisy wheel printer designed for the professional. For use with the Commodore 64 & 128 range of computers the DPS 1101 allows you to obtain the output quality that is generally associated with documents from accountants and solicitors.

The DPS 1101 printer gives the highest quality text output available to 64 and 128 users.

SPECIFICATIONS

Printing System
- Bi-directional, friction feed daisy wheel

Printing Speed
- 17 CPS (Shannon text @ 10 CPI)

Print Wheel
- 100 characters per wheel
- TA compatible

Print Wheel Life
- 10 Million characters per wheel

Number of Characters/Line
- 110 Characters (10 pitch)
- 132 Characters (12 pitch)
- 165 Characters (15 pitch)
- 82 to 220 characters (Proportional Spacing)

Maximum Paper Width
- 33cm (Printable width 28cm)

Carriage Motion
- Bi-directional, incremental motion

Minimum Spacing Speed
- Max 1000 ms

Paper Feed
- Bi-directional, Friction Feed

Minimum Feed
- 1/48 inch

Cartridge Ribbon Type
- IBM 82 Typewriter ribbon
- Single Strike ribbon
- Multi Strike ribbon

Interface
- Commodore Serial Bus

Dimensions
- Height: 173mm
- Width: 607mm

Depth: 343mm
- Weight
- Approximately 13kgs

Power
- 240V at 50Hz at 50W max

Optional and Replacement Items

250017 Replacement Ribbon
601102 Replacement serial cable

RRP $509

Commodore MCS 810 MCS 820 Printers

GENERAL DESCRIPTION

The MCS 810 and MCS 820 are the first really affordable colour and B & W printers designed for the entire range of Commodore personal computers. The 24-element printhead allows up to 100 different colour shades with exceptional definition and clarity. You can print brilliant graphics, charts original illustrations - even acetate transparencies for overheads.

SPECIFICATIONS

Printing System
- Unidirectional ribbon transfer dot matrix

Printing Speed
- Draft quality: 80CPS
- Near Letter Quality: 40CPS
- Graphics: 12 lines/minute

Character Matrix
- Draft: 7 x 18
- NLQ: 14 x 18
- Super/Subscript: 7 x 9
- Underling and Italics: 18 x 18

Print Types and Styles
- Superscript & Subscript, Underlining, Italics

Character Spacing
- 5, 6, 8.5, 10, 12, or 17CPI

Line Spacing
- 6 lines per inch
- 8 lines per inch

Graphics
- High resolution All: 60 x 72 DPI
- Points Addressable: 72 x 72 DPI
- Graphics: 120 x 144 DPI or 144 x 144 DPI

Paper Type and Feed
- Variable width tractor or friction feed from 127mm to 254mm
- Plain or thermal paper
- Acetate transparencies

Interface
- MCS 810: Commodore 64 serial
- MCS 820: Amiga & PC Parallel

Dimensions
- Height: 60mm
- Width: 330mm
- Depth: 190mm

Weight
- Approximately 2.8kgs

Power
- 240V at 50Hz at 40W max

Optional and Replacement Items

280001 Replacement Black Ribbon
280002 Replacement Colour Ribbon
280003 Replacement Paper Rolls
270830 Optional Paper Stand
601102 Optional serial cable for 810
250030 Optional A1000 parallel cable for 820
250031 Optional A500/2000 & PC parallel cable for 820

RRP $499

This document was produced on the Commodore LP 806 Laser Printer

Commodore MPS 1280 Printer

GENERAL DESCRIPTION

In one lightweight, multifunction unit the Commodore MPS 1280 printer provides expanding businesses the right features at the right price.

The MPS 1280 is designed for Amiga and PC users requiring a 136 column (16 inch) report printer for accounting and spreadsheet use.

SPECIFICATIONS

Printing System
- Wide Carriage
- Bi-directional impact dot matrix
- 9 -Pin print Head

Printing Speed
- Draft: 120CPS
- NLQ: 20CPS
- Emphasized: 60CPS

Character Matrix
- Standard: 9 x9 dot

Print Types and Styles
- Empasized, Enhanced, Superscripts, Subscripts, underlining and double width

Character Spacing
- 5, 6, 8.5, 10, 12 or 17.1 CPI

Line Spacing
- 6 lines per inch
- 8 lines per inch

Graphics
- All Points Addressable: 60 x 72DPI 72 x 72DPI
- Graphics: 120 x 144DPI 144 x 144DPI

Paper Type and Feed
- Friction and Tractor Feed
- Friction: 210 - 381mm max paper
- Tractor: 76.2 - 406.4mm max paper
- 0.28mm maximum paper thickness
- No. of sheets: Original + three.

Interface
- IBM Parallel Centronics compatible
- Suits Commodore Amiga and PC range

Dimensions
- Height: 128mm
- Width: 524mm
- Depth: 278.5mm

Weight
- Approximately 6kgs

Power
- 240V at 50Hz at 33W max

Optional and Replacement Items

280004 Replacement Black Ribbon

250030 Optional A1000 parallel cable

250031 Otional A500/2000 & PC parallel cable

RRP $899

Commodore MPS 2020 Printer

GENERAL DESCRIPTION

The Commodore MPS 2020 is the top of the line dot matrix printer for those users requiring speed and quality coupled with the ability to also print in colour.

The MPS 2020 is faster, stronger and more versatile than any other comparably priced printer available today. This unit is suited to both Commodore Amiga and PC users

SPECIFICATIONS

Printing System
- Bi-directional impact dot matrix
- Dual 9-Pin print Head
- Built-in menu select mode

Printing Speed
- Superdraft: 300CPS at 10CPI
- Superdraft: 240CPS at 12CPI
- Draft: 200CPS
- NLQ: 100CPS

Character Matrix
- Draft: 9 x9 dot
- NLQ: 17 x 17 dot

Print Types and Styles
- Emphasized, Enhanced, Italics, Double high, Superscipts, Subscripts and underlining

Character Spacing
- 5, 6, 8.5, 10, 12 or 17.1CPI

Graphics
- Bit Image graphics in 8 or 16 pin
- Single density up to 72 x 72 DPI
- Double density up to 144 x 144 DPI
- Quad density up to 288 x 144 DPI

Paper Type and Feed
- Friction, Pin and optional tractor feed
- Friction Feed 216mm max size paper
- Pin Feed 266mm max size paper
- Tractor Feed 266 max size paper
- 0.36mm maximum paper thickness
- No. of sheets: Original + three

Interface
- IBM parallel centronics compatible
- Suits Commodore Amiga and PC range

Dimensions
- Height: 97mm
- Width: 367mm
- Depth: 305mm

Weight
- Approximately 5.7kgs

Power
- 240V at 50Hz at 0.6A

Optional and Replacement Items

280005 Replacement Black Ribbon

280006 Replacement Colour Ribbon

270832 Optional Tractor Feed

270833 Optional Cut Sheet Feeder

250030 Optional A1000 parallel cable

250031 Optional A500/2000 & PC parallel cable

RRP $1,299

Commodore LP806 Laser Printer

GENERAL DESCRIPTION

The Commodore LP806 laser printer is the ultimate in whisper quite high speed, enhanced, wordprocessing or "Desktop Publishing" applications.

The LP 806 is so affordable that even small and medium sized businesses using a Commodre PC, Amiga or compatible can purchase their first laser printer.

SPECIFICATIONS

Printing Sysytem
- 300DPI Laser printing

Printing Speed
- 6 pages per minute
- Warm-up time: 45 seconds
- First Print Time: 25 seconds for text

Component Characteristics
- Light Source: Semiconductor laser
- Image Drum: Organic Photoconductor
- Toner: Dry Monocomponent
- Fuser: Heat and pressure

Print Types and Styles
- 15 Inbuilt Fonts
- Bold, Italics, Landscape, Compressed, Superscript, Subscript, underlining, etc.

Paper Type and Feed
- Auto and Manual Feed
- Paper Tray Input: 150 sheets max.
- Auto Feed: Letter and Legal paper
- Manual Feed: Business envelopes, label stock, overhead transparencies (subject to suitability for laser printing)

Memory
- User Memory: 113K bytes
- Optional User Memory: 384K, 497K total
- Additional Memory: 159K (receive and print buffers)

Emulations
- Resident: HP LaserJet Plus
- MS-DOS Diskette: Diablo 630 API, Epson MX, IBM Graphics, NEC 3550 and Qume Sprint XI

Interface
- Advanced parallel
- Suits Amiga and PC range

Dimensions
- 205mm (H) x 417mm (W) x 407mm (D)

Weight
- Approximately 15kgs

Power
- 240V at 50Hz at 4A

Optional and Replacement Items

280010 Replacement Toner

280011 Optional Maintenance Kit I

280012 Optional Maintenance Kit II

280014 Optional Memory Upgrade

250030 Optional A1000 parallel cable

250031 Optional A500/2000 & PC parallel cable

RRP $3,999

This document was produced on the Commodore LP 806 Laser

Star NX-10 Printer

I've had my Star Gemini 10x for over two years and have been more than satisfied with it so I was pleased to have the opportunity to review a later model Star printer known as the Star NX-10.

This has many features not found on earlier printers such as easy front panel control of many of the things you'll want to do when printing a document.

Features selectable from this "touch-panel" include:

Left and right margin settings
Forward/backwards micro-feed
Two types of self-test
Panel mode*
Form feed to top of next sheet
Italic mode
Hex dump mode
Print mode selection**

* Panel mode locks out control commands sent by your word processor or other program, allowing you to print another copy of your document in, say, condensed print (136 columns) without any changes to the command string.

** Mode selection includes 80/96/136 (this means characters per line on normal paper), or in other words normal size/elite size/condensed size characters, OR you can select NLQ which give normal sized print in Near Letter Quality printing.

This printer uses a cartridge ribbon which just drops into place and by simply moving the print-head sideways (with the printer off-line) the ribbon is automatically fed into place and you don't get your hands dirty! Replacement ribbon cartridges are readily available at around $16 or you can get a refill, called a Zip-pack, for around $7 or $8 which you can fit into the cartridge yourself. It's all explained in the instruction book, which I found to be easier to understand than some other instruction books I've had (or maybe it's me that's finally learning something!).

Being a non-Commodore (or third party) printer, the Star NX-10 needs to be connected to the Commodore 64 with a suitable interface so that they can "speak the same language". Having used the Xetec Super Graphics Senior interface on the Gemini 10x I opted for the same thing on the Star NX-10 and it worked like a charm. The Xetec interface has many features which the NX-10 takes full advantage of, like downloadable fonts, a further NLQ font and an 8K printer buffer for example.

The Star NX-10 comes fully equipped with a tractor-feed for continuous paper, or you can easily feed single sheets in manually for special jobs. It sells for around $540 from most printer and computer outlets.

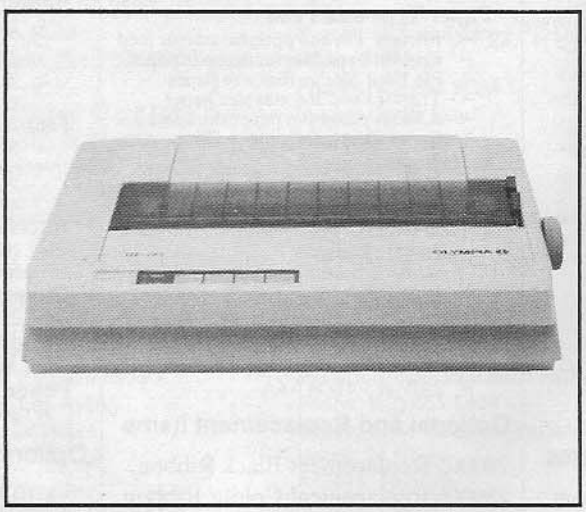
The NX-10 was compatible with all the graphics printing programs I tried on it including :*Print Shop*, *Printmaster*, *Doodle*, *Koala Painter*, *Certificate Maker* etc. and did a good job on all of them. It ran all of my *Easy Script* files which had embedded commands for the Gemini 10x and I thought it was a nice printer to work with.

If you're looking for a good all-round printer for word-processing and graphics printing then this could be just what you need.

The Star NX-10 Printer is distributed by Star Micronics, Unit 7/25 George St, Homebush, (02)736 1144. R.R.P. $525.

Xetec Interface is from The Printer Specialists, 31 Elgin St, East Gordon, (02) 498 3333. R.R.P. $170.

Olympia NP30



The Olympia NP30 looks quite at home next to the current greyish beige casing of a Commodore 128D.

The ribbon comes in the form of a small cartridge which sits immediately behind the printhead. A flat panel on the top front of the printer provides controls for select, line feed, form feed and near letter quality. The buttons have a positive feel and are attractively styled.

The built-in tractor feed is semi-adjustable, making it a little awkward to use for labels or narrow stationery.

Inserting paper is quite simple. Rather than the auto feed process employed by some printers, which is somewhat complicated and occasionally cumbersome, you simply position the paper behind the paper bail, then move the paper bail lever to the forward position. A further gentle push will cause the paper to feed through for as long as you hold down the lever. This allows you to position the paper as quickly and more easily than the auto feed method.

Just to the left of the operation panel a slide cover opens to reveal a set of dip switches. These control such functions as the paper end sensor, graphics mode, page length, device number and other assorted features.

At long last we have a printer that need never be turned on its belly to have its Phillips screws removed and the dip switches adjusted.

In Commodore mode the printer is capable of printing in Pica, Elite, Condensed, Expanded and Underline. It will also handle Superscripts and Subscripts, Emphasized, Double Strike, Reverse Printing and up to 20 CPI.

A solid printer with a positive feel to its controls and more than average print quality. Extra points for speed and ease of use. Olympia have built a practical printer that performs well. Ideal for home or small business. Distributed by Comandglen (02) 686 1522

RRP $645 but ring Comandglen for special price.

User Groups

Enthusiastic users of Commodore equipment often pool together to form a club or user group. They provide a basis for people to exchange information about their equipment. They can swap ideas, solve problems, arrange purchasing discounts and organise special meetings.

Different User Groups offer a wide variety of services. A few have workshops once a month, most meet at least twice a month. We strongly recommend you consider joining one. Membership ranges from $15 to $30, and usually includes some form of newsletter or magazine

Not all are as professionally run as others. Try to find one that doesn't concentrate too much on the running of the group. These tend to become boring very quickly. Some of the most exciting and innovative clubs have a very brief charter, and little or no rules of operation.

The following list should serve as a rough guide to user groups in your area. Every group we were aware of at the time of publishing has been included. As the contact numbers do change from time to time, and not all clubs inform us of these changes, we can take no responsibility for the accuracy of this list.

If you know of or operate a User Group that is not on this list, please fill in the form at the back of this publication and forward it to the address stated. We regularly publish up-dates to this list in the *Australian Commodore Review.*

Name: ACT VIC-20 USERS ASSOCIATION
Postal: 25 Kerferd Street,
Address: Watson ACT
Post Code: 2602
Telephone: (062) 412316 aft6pm

Name: Albury/Wodonga Commodore User Group
Postal: P.O. Box 1014
Address: Albury NSW
Post Code: 2640
Contact: D. Willis, Secretary

Name: Amiga Users of the Northern Territory
Abbreviation: A.U.N.T.
Postal: C/- 4/4 Armidale Street
Address: Stuart Park NT
Post Code: 5790
Telephone: Contact: R. Rawinski

Name: Australasian Amiga Users Association
Abbreviation: AAUA
Telephone: (047) 514 143
Contact: Ray Wilson

Name: Australian Amiga User Association Inc.
Postal: C/- Post Office
Address: Penrith
Post Code: 2750
Telephone: (047) 536 028

Name: Ballarat C-64 Club
Postal: 142 Eureka Street
Address: Ballarat Vic
Post Code: 3358
Telephone: (053) 331 863
Contact: Cheryl Allen
Meetings: Every Sunday 9.00am

Name: Bay Users Group
Postal: P.O. Box 308
Address: Nelson Bay NSW
Post Code: 2315
Telephone: (049) 811731
Newsletter: GOSUB

Name: Brisbane Commodore Computer Users Group (Qld) I.
Postal: P.O. Box 274
Address: Springwood Qld
Post Code: 4127
Telephone: (07) 3415651
Contact: Norm Chambers, Sec.

Name: Bull Creek Vic Ups Commodore Computer Group
Abbreviation: V-CBULLC
Postal: 862 Forrest Road
Address: Jandakot WA
Post Code: 6164
Telephone: Contact: L. Boelan
Meetings: 1st & 3rd Tuesday
Location: Willton High School

Name: Bundaberg Commodore Computer User Group
Abbreviation: B.C.C.U.G.
Postal: P.O. Box 1713
Address: Bundaberg
Post Code: 4670
Telephone: (071) 727 794
Contact: Marian Cheshire (Sec)
Meetings: 1st Sunday each month
Location: Library Bundaberg West State School
between 10am and 2.30pm

Name: Christchurch Commodore Users' Group, Inc
Abbreviation: The C.C.U.G.
Postal: 3 Paulus Terrace,
Address: Christchurch 2
Telephone: 34 382
Contact: Tony Petre

Name: Commodore Computer Club W.A. (Inc).
Postal: P.O. Box 146
Address: Willetton
Post Code: 6155
Telephone: (09) 332 6374
Contact: Ton Lee
Meetings: 1st & 3rd Tuesday each month
Location: Willetton High School
Newsletter: Vic-Ups News

Name: Commodore Computer Users Association
Abbreviation: CCUA
Telephone: (047) 391 528
Contact: Tony Ellis
Meetings: 7.30pm on last Wednesday of month.
Location: The 729 Club, Lithgow St St Leonards (informal)

Name: Commodore Great Western Users
Abbreviation: GRTWEST
Telephone: (02) 636 2080
Contact: Sam
Meetings: 1st Tuesday each month
Location: Church Hall, Catholic Church, Old Prospect Rd., Greystanes
Newsletter: Byte

Name: Commodore Great Western Users Group
Abbreviation: GRTWEST
Postal: 2 Bridge Street
Address: Granville NSW
Post Code: 2142
Telephone: (02) 637 6282
Contact: Lisa Bullivant
Meetings: 1st Tuesday each month
Location: Greystanes Community Centre
Merrylands Road, Merrylands
Newsletter: Byte

Name: Commodore Hornsby User Group
Abbreviation: CHUG
Postal: P.O. Box 1578
Address: Hornsby, Northgate
Post Code: 2077
Telephone: (02) 476 4391
Contact: Jill Rassack, Secretary
Meetings: 7.15pm 4th Wednesday of each month
Location: St Leos College, Woolcott Ave, Waha
Newsletter: Peripheral/Line Feed

Name: Commodore User Group (Townsville)
Telephone: 726454
Contact: Tony Moore
Meetings: 7.30pm 1st Wednesday of each month
Location: Ignatius Park College, Computer Room

Name: Commodore User Group A.C.T.
Abbreviation: CUGACT
Postal: P.O. Box 599
Address: Belconnen ACT
Post Code: 2616
Telephone: (062) 48 9527(H)
Contact: John Hambley, Secretary
Meetings: 7.30pm 1st Monday/3rd Monday
Location: Melba High School/Woder Library

Name: Commodore Users Group Mackay
Abbreviation: MACK CUG
Postal: P.O. Box 422
Address: Mackay QLD
Post Code: 4740
Telephone: (079) 422 068
Contact: Ken Johnston
Meetings: Wednesday fortnightly 7.30pm
Location: Mackay Teachers Centre Nelson Street
Newsletter: Not named at present

Name: Comp-Tel (Telecom User Group)
Postal: 138 Barcom Ave
Address: Rushcutters Bay NSW
Post Code: 2011
Telephone: (02) 231 1111
Contact: O. Davide
Meetings: Mostly by telephone or when necessary by Pitt telephone
Location: exchange
Newsletter: Comp-Tel

Name: Compu-Tech Users Club
Postal: P.O. Box 43
Address: Islington NSW
Post Code: 2236
Contact: Geoff Rayner, Secretary
Meetings: Last Tuesday each month, 7.00pm
Location: Newcastle Technical College
Newsletter: Victim

Name: Computer Cellar Pty. Ltd.
Newsletter: Vic Down Under

Name: Comstrad Computer Users Group
Postal: 22 Wilson Street,
Address: Caboolture Qld
Post Code: 4510
Telephone: (075) 95 3566
Contact: Marcus Dwyer
Meetings: 1st/3rd Saturday each month 6-9pm
Location: Caboolture Anglican Church Hall
Newsletter: Syntax

Name: Eastern Suburbs Commodore User Group
Abbreviation: ESCUG
Postal: P.O. Box 236
Address: Botany NSW
Post Code: 2019
Contact: Carol Shearman
Meetings: Every 2nd Monday 8.00pm
Location: State Emergency Services Hall, rear 1355 Botany Street, Botany

Name: Gold Coast Computer Club
Postal: P.O. Box 645
Address: Palm Beach Qld
Post Code: 4221
Telephone: (075) 562 336
Contact: Cyril White
Meetings: every 2nd Tuesday 7-9pm
Location: Elanora State School

Name: Gosford Commodore User Group
Abbreviation: GOSCOM
Postal: P.O. Box 86
Address: Umina Beach NSW
Post Code: 2257
Telephone: (043) 24 7124
Meetings: 3rd Wednesday each month 7.30pm
Location: Niagara Park Public School
Newsletter: Output

Name: Goulbourn Commodore User Group
Postal: 34 Chantry Street
Address: Goulbourn NSW
Post Code: 2580
Telephone: (048) 212 704
Contact: Geoff Bassingthwaight
Meetings: 2nd Tuesday each month 7.00pm
Location: Southern Tablelands Education Centre

Name: Horsham Commodore User Group
Abbreviation: HORSHCUG
Postal: P.O. Box 676
Address: Horsham Vic
Post Code: 3400
Telephone: (053) 824 345
Contact: Ian Rees
Meetings: 2nd Wednesday each month 7.30pm
Location: Various

Name: Ipswich Commodore Computer Users Group
Abbreviation: I.C.C.U.G.
Postal: R. Mansfield, 91 Downs Road,
Address: North Ipswich
Post Code: 4303
Telephone: (07) 288 8880/
Contact: Ron North (Sec)
Meetings: 2nd & 4th Tuesday of each month
Location: East Ipswich State School
Newsletter: Feedback - monthly

Name: Katoomba Commodore User Group
Postal: 10 Rosebery Street,
Address: Wentworth Falls NSW
Post Code: 2782
Telephone: (047) 57 1408
Contact: P. Edwards
Meetings: Every 2nd Tuesday 7.30pm
Location: Katoomba High School

Name: Knoxcom Inc. Commodore Users Group
Postal: 71 Folkstone Cres
Address: Ferntree Gully
Post Code: 3156
Meetings: 8.00pm, second Thursday each month.
Location: Boronia Community Centre, Park crs Boronia

Name: Macquarie Fields Commodore User Group
Telephone: (02) 610 3685
Contact: Andrew Price
Meetings: 2nd & 4th Wednesday each month
Location: Macquarie Fields Community Hall, Fields Road, Macquarie Fields

Name: Melbourne Commmodore Computer Club Inc.
Postal: P.O Box 177
Address: Box Hill
Post Code: 3128
Meetings: 7.30pm. third Tuesday each month.
Location: Nunawading Civic Centre

Name: Melbourne Commodore Computer Club Incorporated
Postal: P.O. Box 252,
Address: Northcote
Post Code: 3070
Telephone: Contact: John Ruddock, Secretary
Meetings: 7.30pm 3rd Tuesday of each month
Location: Nunawading Civic Centre (next to Library)

Name: Mermaid (Business) Users Group
Postal: P.O. Box 76
Address: Mermaid Beach
Post Code: 4218
Telephone: (075) 39 8427
Contact: Ron Perry
Meetings: Fortnightly
Mermaid Computers, "Home In"
Location: Shopping Complex, Gold Coast Hwy, Mermaid Beach

Name: Mount Morgan Commodore User Group
Postal: 22 Dee Street
Address: Mount Morgan
Post Code: 4714
Contact: G. Thomas (Ass. President)

Name: NZ Microcomputer Club
Abbreviation: NZMICROC
Postal: P.O. Box 6210
Address: Auckland, New Zealand
Telephone: 64 9 452 639
Contact: Terry Bowden
Meetings: 1st Wednesday each month 7.30pm
Location: 107 Hillsborough Road, Mt. Roskill
Newsletter: NZ Micro in Bits & Bytes Magazine

Name: Peninsula Commodore Users Group
Abbreviation: PENCUG
Postal: C/o Red Hill Consolidated School
Address: Flinders Rd, Red Hill Vic
Post Code: 3937
Telephone: (059) 895 785
Contact: Luke Button
Meetings: 1st Wednesday/3rd Tuesday
Red Hill Consolidated School,
Location: cnr. Arthurs Seat Rd & Flinders Rd, Red Hill

Name: Penrith Commodore Users Group
Abbreviation: PCUG
Postal: 21 Harris Street
Address: Penrith
Post Code: 2750
Telephone: (047) 32 1315
Contact: Terry Barrett
Meetings: 1st Sunday Suite 17 Lethbridge Court at 1.00pm
Location: 3rd Wed.The Victoria St.Community Cottage Victoria St.Werrington 7.30
Newsletter: Commodore Capers - monthly

Name: Pittsworth Microcomputer Users Society
Postal: P.O. Box 166
Address: Pittsworth QLD

Post Code: 4356
Contact: David Siebuhr
Meetings: 1st Monday each month 4pm
Location: Masonic Hall
Newsletter: Pittsworth Microcomputer Users Soc

Name: Raaf Laverton Commodore User Group
Postal: R.A.A.F. Base, Laverton
Address: Melbourne Vic
Post Code: 3027
Telephone: (03) 3682457
Contact: Neville Hewlett, Secretary

Name: RAAF Richmond Commodore User Group
Abbreviation: RRCUG
Postal: C/- OIC 486FTF
Address: RAAF Richmond
Post Code: 2755
Telephone: Contact: I. Mercier
Meetings: every two weeks
Location: On the Base

Name: Rockhampton Commodore Users Group
Abbreviation: ROCHCUG
Postal: P.O. Box 5733
Address: Rockhampton Mail Centre Qld
Post Code: 4702
Telephone: Contact: Kay Lanyon
Meetings: 1st Monday each month
Location: Berserker Street School
Newsletter: RCUG Newsletter

Name: South Australian Commodore Computer Users Group

Postal: P.O. Box 427,
Address: North Adelaide SA
Post Code: 5006
Telephone: (08) 263 6349 (H)
Contact: Lilly Woer
Meetings: 7.30pm 1st Tuesday of each month
Location: Gillies Street Primary School, Gillies Street, Adelaide
Newsletter: Bits and Bytes

Name: Southern Districts Commodore Users Group
Abbreviation: STHDIST
Postal: 3 Lucille Crescent
Address: Casula NSW
Post Code: 2170
Telephone: (02) 602 8691
Contact: L. Toms
Meetings: 1st/3rd Wednesday each month 6-8pm
Location: API Hall, Kurrajong Road, Prestons

Name: Southport Commodore Computer Users Group
Abbreviation: S.C.C.U.G.
Contact: Merv McFalane,Secretary
Meetings: Every Monday 7pm
Labradore State Primary School,
Location: Gordon Street Entrance
Name: Springvale CUGVIC
Postal: 10 Sheridan Court
Address: Dingley VIC
Post Code: 3172
Meetings: 2nd Monday each month
Location: Dingley Community Centre
Newsletter: Commodore 64 User Group Newsletter

Name: Sydcom
Postal: P.O. Box 1542
Address: Sydney NSW
Post Code: 2001
Telephone: (02) 521 8765
Contact: Barrie Bartin
Meetings: 2nd Wednesday each month
7.30 - 10.00pm
Location: Ryde Catering College, Blaxland Rd
Ryde - opposite Kulgoa Ave
Newsletter: Peripheral

Name: Tamworth C.Y.S.S.
Postal: P.O. Box 1104
Address: Tamworth NSW
Post Code: 2340
Telephone: (067) 665 136
Contact: Mr. Mark Nickols

Name: Tasmanian Commodore Users Association
Postal: G.P.O. Box 673
Address: Hobart Tas
Post Code: 7001

Name: The Barossa Users Group (BUG) Computer Club
Postal: RMD Box 1
Address: Daveyston Via Greenock SA
Post Code: 5360
Contact: Mark T. Leske (Sec)

Name: The Commodore User`s Group (Victoria) Inc Postal: P.O. Box 64
Address: Abbotsford Vic
Post Code: 3067
Newsletter: Commodore 64 User's Group

Name: The Happy Hackers Adventure Club
Abbreviation: ADVNTNEW
Postal: MSF 550
Address: Toogoolawah QLD
Post Code: 4313
Telephone: (075) 83 5119
Contact: Stuart Elflett
Meetings: Postal Group

Location: Australia Wide
Newsletter: Adventure News

Name: The Hastings (Computer) Users Group
Abbreviation: T.H.U.G.
Postal: 8 Mitchell Circuit
Address: Port Macquarie
Post Code: 2444
Telephone: (062) 840464
Contact: Arthur Sawilejsrij
Meetings: 7.30pm 1st Monday of each month
Location: Port Macquarie CYSS; 73 Lord St., Port Macquarie
Newsletter: Newsletter - monthly

Name: The Shepparton Commodore Computer Club
Telephone: (058) 214746
Contact: Val Hutchinson
Meetings: Sunday evening, 7.30pm
Location: 1st Shepparton Socut Hall,
Welsford Street, Shepparton
Newsletter: The Communicator

Name: Tuggerah Lakes Commodore Users Group
Abbreviation: T.L.C.U.G.
Postal: 125 Woolana Aveune
Address: Budgewoi NSW
Post Code: 2262
Telephone: (043) 907 339
Contact: Frank James
Meetings: 1st & 3rd Thursdays at 6.30pm
Location: Old Primary School, Wyong cnr. Alison Rd & Rankin St

Name: VIC-UPS Computer User Group
Postal: P.O. Box 178
Address: Nedlands WA
Post Code: 6009
Telephone: (09) 332 5313
Contact: Russ Coppins
Newsletter: VIC-UPS News

Name: VIC-UPS Nedlands (Inc)
Abbreviation: V-UNEDL
Postal: P.O. Box 386
Address: Claremont WA
Post Code: 6010
Telephone: (09) 367 1462
Contact: Norm Holtzman
Meetings: 2nd & 4th Saturdays each month
1.30pm - 4.30pm
Location: Hollywood Senior High School Smyth Road, Nedlands
Newsletter: Vic-Ups News

Name: Victorian Amiga Users Group
Postal: P.O Box 109
Address: Nth Balwyn
Post Code: 3104
Telephone: (03)792 9666
Contact: Neil Murrey
Newsletter: Workbench

Name: VK Commodore Users Group
Abbreviation: VKCUG
Postal: P.O. Box 168
Address: Launceston Tas
Post Code: 7250
Telephone: (003) 26 2401
Contact: R.K. (Bob) Richards
Meetings: On amatuer radio 3.570MHZ
0900 UTC Sundays

Name: Waverley Commodore User Group
Postal: C/- 329 Springfield Road
Address: Nunawading Vic
Post Code: 3131
Telephone: (03) 569 8481
Contact: H. Younger
Meetings: 4th Thursday 7.30pm
Location: Alvie Hall, Alvie Road, Mt. Waverley

Name: Wollongong C-64/C128 Users Group
Postal: 155 Jacaranda Ave
Address: Figtree
Telephone: (042) 288580
Contact: P. Stanhope,Secretary

Name: Yarra Valley Commodore Users Group
Postal: P.O. Box 176
Address: Lilydale Vic
Post Code: 3140
Telephone: (03) 725 0682
Contact: Dorothy Millard
Meetings: 1st Tuesday each month 8.00pm Melba Hall
Location: Cnr. Market & Castella Streets Lilydale

Utilities

Programming utilities

Writing a program is a creative exercise. Like a sculptor's tools or a painter's brush, are the many utilities that can be put to work. They take the mundane parts of programming and make them far simpler. Performing tasks that would take hours to do by hand. Creating graphics, sound and the management of your program requires careful planning.

Using a toolkit, much of the mathematics of building sprites, custom character sets, or the guesswork of making music can be alleviated. Commodore endowed the 64 with a crude BASIC. Most of the machine's features are not well supported. Because of this the need for a helping hand here and there is even greater.

Due to the large number of machines sold, many enthusiasts have produced some extremely useful aids to programming. Many are directed specifically at disk users, in the area of general maintenance and tidiness. Files need to be moved, copied, erased, renamed. Directories become cluttered, need alphabetising or rearranging.

For all these tasks, much commercial software is also available. Commodore themselves collated a Programmer's Development Kit not long after the 64's release. Since then, a single disk of Programmer's Utilities has been made available based on one of the three disks in the original kit.

Selling for around $28, it contains some useful material. A machine code monitor that allows memory to be examined and your own assembly language programs to be written, is included. The version I have contains two, each one located in a different area of memory. That way, if one conflicts with what you are doing, the other should be out of the way.

Pet Emulator comes in handy if you have access to any old PET programs. Once run, it configures the C64 in a similar way to the older Commodore machines. Whilst not all PET software well then work, most of the better programs will at least load properly.

DOS Wedge, also included on the demonstration disk which comes with the 1541, is an invaluable help to using your disk drive. It adds a range of additional commands for simple one or two keystroke loading of files. It is also possible to send DOS commands in a simple manner as well as obtaining a directory without destroying the file in memory.

A rudimentary character editor allows you to create your own character set. As each letter is being edited, it is displayed in full, in an enlarged form on the screen. Each of the dots or pixels which make up the character are displayed in the squares of a small grid. This method is fairly standard for all character editors. Special keys allow you to rotate and shift the grid for some really wacky effects.

Similarly, the sprite editor allows the definition of up to 150 sprites, in single colour mode. Once designed they may be viewed moving about the screen, to see how they might look once part of a real game or whatever program you have in mind. When you are satisfied with your designs, both the sprites and characters may be saved to disk for later use.

Sounds may be toyed with using **SIDMON**, a crude but effective means of playing with the registers in the SID chip. Waveforms, ADSR filters and various other attributes may be modified. Once you have a good sound, simply jot down the register values to include in your own programs.

A screen editor is very useful for business software. Dates, numbers and alphabetic or alphanumeric entries may be controlled and confirmed quickly and simply. Whilst this routine is not without its fair share of bugs, it works effectively most of the time.

There's a few other bits and pieces on the utility disk, which change from time to time. You may obtain a copy from most user groups, who are incidentally an excellent source of public domain utilities. The price should be no more than the cost of a blank disk - if that.

Graphics

Character editors and sprite editors are often available separately. The better commercial packages allow for animation and the design of full colour sprites.

For a list of graphics programs and reviews of *Cockroach Graphics Utility (Cockroach Pirate), OCP Art Studio, Flexidraw* and *Artist 64*, see the Graphics section in this Annual.

Graphics Workshop - The program is virtually fully menu driven. There's a character editor, sprite editor, sprite animator, animation editor, hi-res graphics routine, split screen generator and more. Tutorials, help screens etc.

All the routines are supported by a program that tells you how they work. Each of the editors may be accessed from the main menu, and when you have finished playing around with your designs, you can return to the main menu with a single keystroke.

From the character editor, you may also design shapes consisting of several characters joined together. Individual characters may be rotated, reflected, shifted and reversed. They may also be copied, deleted, or saved to disk for inclusion in your own programs. The sprite editor has similar features, with the addition of multicolour mode.

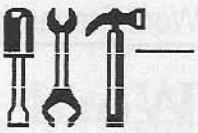
Once you have designed your sprites, move to the animation editor, and you may view a series of sprites. They may be fully animatedThe program which does all the animation is a utility within itself and may be included in your own software. It manages all the movement of sprites, and is interrupt driven.

This means that the animation takes place without any effort on befalf of your program. It is a background task.

Another useful utility is the split screen generator. This allows you to have two background colours - normally not possible, and to have a redefined graphics area in the centre.

Hi-res graphics may be obtained using a simple utility that will draw lines in single colours on the hi-res screen. Simple to use, and comes complete with tutorials on disk that explain the various principles of redefined characters and sprites.

Doodle is great for mixing text and graphics, with facilities to expand and shrink parts of your picture. This is an option not usually found on graphics software on the Commodore. The *Koala Pad* is more suited to free hand drawing, with more control over the colour aspects. Also popular are *Sketch Pad* and more recently *Blazing Paddles.*



trosound 64, Euphony, and *Commodore Sound Sampler.*

Music is another area where a large number of utilities exist to make design easier. The Kawasaki range is probably the most famous, however, little or no allowance is made for including your compositions in your own software. *Music Composer* is similar, however that too is a stand alone product. Imagineering's *Music Construction Set* allows some inclusion of your creations in your own software, however that has a few problems.

Synthy 64 is similar, but once again, inclusion within your own software is difficult. I tend to think that it ceases to be a utility once you can't use it in your own programs. Perhaps the tried and tested *SIDMON* is the best place to start.

Compilers & disk editors

Other utilities that are invaluable to the programmer are the compiler and disk editor. *Petspeed* was distributed by Commodore some time ago, and whilst it was not the best of compilers, it was ample for many applications. Compilers change BASIC code into machine code, or machine code with a run time library. This greatly increases the speed of execution as less code has to be interpreted.

DTL Compiler is about the best around. It is not officially distributed by anyone, however some stores may have the odd one or two. It has the added flexibility of being able to compile BASIC extensions. It also replaces the low garbage collection routines, greatly speeding up large BASIC programs.

Disk utilities would have to include all the various fast load cartridges - of which there are many. *Epyx Fastload* is very popular, as is the *Turbo Rom* from Cockroach software. The *1541 Express* is another goodie. ROM replacements tend to be the best way of speeding up the drive as well as adding the DOS wedge mentioned earler. However, some circuit boards are not socketed, making any changes rather expensive.

Speeding up your disk drive - see reviews of Dolphin DOS and Cockroach Turbo Rom in our Disk Drives section in this Annual.

Printer utilities - see the section on Disk Drives in this Annual for a review of Cardco +.

Micro Accessories of Australia distribute many excellent utilities - see their advertisement in this Annual on pages 48/49.

Utility	Type	Distributor	Price
Capture Cartridge	EPROM burner	Lion Electronics	$88.95
Cockroach Turbo ROM	DOS speed up add on	Cockroach Software	$42.00
Dolphin DOS	DOS speed up add on	Micro Accessories	$169.00
Fast Load	Epyx DOS speed up add on	ECP	$49.95
Final Cartridge	DOS speed up add on/printer & disk utilities	ComputerScope	$139.00
Freeze Frame II	DOS speed up add on	Micro Accessories	$99.00
Graphics Workshop	Sprite/Character Editors/Utilities	Prime Artifax	$10.00
Laser Basic/Compiler/Genius	Extended Programming language/compiler/utilities	OziSoft	$59.95
Megasoft Utilities	Various disk & program aids	Pactronics	$24.95
Power Cartridge	Disk toolkit, monitor, print dumps, fastdos	OziSoft	$149.00
Programmer Basic Toolkit	Epyx programming utilities	ECP	$59.95
Quickdisc+	Fast loader plus utilities	Micro Accessories	$49.95
Super Printer Utility	Cardco hi-res screen dumps	OziSoft	$69.95
Vorpal Utility Kit	Fast Dos & Utilities	ECP	$59.95

Word Processing

It's not hard to see why word processing has it all over typing like a sheet of continuous paper. The advantages of word processing are many and the disadvantages almost non-existent. The first word processors were large, and by today's standards, rather slow. They were dedicated word processors, which basically means they didn't do anything except word processing. They had all the functions of the modern word processing program which runs on personal computers, but less versatility.

Firstly, word processing uses so much less paper. This may seem fairly unimportant to non-Greenies, but it has a direct correlation with time and convenience. Instead of furiously tearing the sheet of paper from the roller, squashing into a ball and tossing into the nearest wastepaper basket when you make a mistake typing, word processors allow you to coolly cursor back to the error, correct it, and continue merrily on your way without turning a hair. Instead of innumerable drafts, covered with scribbled corrections, the first piece of hard copy is nearly always the last.

Word processing has other huge advantages - the ability to move blocks of text around saves on time, effort and frustration. White-out and carbon paper collect dust and cobwebs, shoved right to the back of the word processor operator's desk. And the sheer portability of word-processed documents is a luxury. Just tuck a couple of disks into a breast pocket and stroll casually out of the office.

The other handy thing about modern word processing programs is they often have dictionaries and thesauruses built in. Or at the very least, the hook-up is there for these references should you wish to buy the separate programs. These computer aided dictionaries are amazing things. In these days of modern education, it's horrendous how many kids can't spell for peanuts. They're excellent at reducing modern classics to newspaper headlines, but i before e is totally beyond them.

A dictionary program will run through a document typed in by one of these spelling incompetents and stop at every single misspelled word. You then have the choice of ignoring the computer and progressing to the next word, or correcting the mistake, or adding the word to the dictionary. In this way you can build up a mini-dictionary of words peculiar to your trade or profession, and in the future the computer will skim past them, unless of course, they are misspelled.

Some programs will even guess at the word you are trying to spell and offer you a choice of correctly spelt alternatives. Dictionary programs will often let you know exactly how many words you have typed, which is a blessing for journalists and other poor fools who have to write to length.

Of course, the finished word processed product depends entirely on the print formatting capability of your word processing program and the quality of your printer. For information on printing, see our Printer Section in this Annual.

Word Processing Glossary

Justified type. This means that you can format the page so the lines begin and end exactly at the left and right margins. The computer adds the correct amount of space between words to allow this to happen. Many books and magazines use justified type, it can look very professional. This article, for instance, is set in justified type. It only works well with fairly wide sections of type, though. Set in columns too narrow, justified type can look very strange.

Flush left, ragged right. This is the ordinary way of formatting a page. It results in an even line down the left hand side of the page, and the lines ending within a right margin, but not evenly. Flush left, ragged right is basically what you get from an ordinary typewriter.

Bold and italics type. Simple commands in the word processing program will allow you to nominate certain pieces of copy that you wish to be bold or italics. It is a neat way of emphasising a word or sentence, and looks far more professional than underlining, although you can of course underline should you want to.

Spelling Checker. Runs through text and stops when a spelling error is detected. Allows you to add and delete from the dictionary thus creating your own dictionary with specialised words.

Subscripts and superscripts. These are the little numerals or characters that appear slightly above or below the line of type. They are often used in academic documents, and are simple to employ with a word processing program.

Variable pitches. Changing pitch means you can alter the way the type looks. You can make the type condensed or with more space around the letters, depending on what is required.

Headers and footers. These are the explanatory lines at the top and bottom of pages. Again, they are often used in academic treatises, or in newsletters. The computer, formatted correctly, will automatically enter headers and footers on every page of the document.

Fonts. A font is a particular type style. Serif fonts have the little squiggly bits on the letters, and sans serif fonts are more modern characters without serifs. Some word processing programs will allow you to choose the font style.

With all these commands at your fingertips, you can do just about anything with your pages. You can produce a slick piece of finished copy, a professional letter, or a long, legible article. The permutations are endless.

WYSIWYG. What you see on the screen is what you get when you print out.

Kwik- Write

Kwik-Write is a revolutionary full-featured word processor for the Commodore 64 that delivers the quality and power of dedicated word processors at an affordable price. To use *Kwik-Write* you need a Commodore 64 or Executive 64, a 1541 disk drive, a monitor and electricity. A printer is optional, though highly recommended, as is electricity.

The MAIN MENU will be displayed when KWIK-WRITE! has been loaded:

MENU

L-LOAD FILE	C-CREATE FILE
S-SAVE FILE	E-EDIT FILE
D-DIRECTORY	O-OPTION
K-KWIK-DOS!	P-PRINT FILE

SELECT

NOTE: To return to the MAIN MENU from any other place in KWIK-WRITE!, press f1.

The main menu is the central command point from which you instruct *Kwik-Write* to manipulate your documents: load, save, create, edit and print. You also display disk directories and access the Kwik-DOS menu via the Main Menu.

Compared to say *Easyscript* where at the top of the screen is the command line and at the bottom a status line, this has none of any significance.

File saving and loading is quick and painless. Both are accessed from the main menu. One thing that is a bit of a worry is that the program does not check to see if a file already exists but just erases anything by the same name.

Other features include a search and replace function, allowing you to search through a document for the occurrence of a phrase with the option of replacing it with another, one paragraph at a time.

Boasting loading and saving time as being 300% faster, *Kwik-Write* is a competitive full-featured disk attractively priced at just $35.95, and complete with a comprehensive easy to follow manual.

For that kind of money you just cannot go wrong.

Distributed by Pactronics, (02) 407 0261 R.R.P. $39.95

Paperclip II for the 128

Very few programs arrive with as much literature in the box as *Paperclip II.*

The books, brochures, manuals (and Errata sheet) all have a professional look and feel. Loading the program requires the insertion of the "Program Key", or "Dongle" which is supplied.

The use of a dongle means that back-up copies of the disk can be made, but cannot be run without the key inserted.

My first impressions of the program, having just loaded it, are twofold. Firstly, I have no idea how to do anything other than enter text. There are no hints on the screen, and nothing happened when I pressed HELP. Maybe I'll have to look in the manual after all.

Other features which really excite me are the promise of a spelling checker that checks an entire document in 30 seconds.

Sounds too good to be true. Excuse me while I try it out. Press CONTROL, then shift 'Y', turn over the main disk and press RETURN... 55 seconds later, and I'm back. This is just like live radio! The program took just under 45 seconds to check the 242 words I have just written, and queried the obviously wrong "speeling", a few specialised words like "dongle", and the innocent looking word "My". I've always spelled "My" that way. How embarrassing.

Text Editing features of *PaperClip* are among the best I have ever seen. A comprehensive set of editing functions makes text entry very convenient, and very fast.

As I mentioned above, the speed with which you can move around text is great. Better still, there is even a 'super-fast' cursor option, which lets you move up and down your text at a blinding rate. Commands for moving up or down by 22 lines (a 'screen page'), moving to the top or bottom of the text, or moving to predetermined 'bookmark' points are also available, together with all the standard tab and wordwrap options.

As *PaperClip* uses "post formatting", control characters must be entered in your text to define how the output should look.

The program disk provides a huge number of printer definitions, and it is likely that you will find something suitable predefined.

The "Video preview" function allows the text to be viewed on screen as it will be printed. No changes can be made to the text in this mode, but those who are familiar with the old *EasyScript* preview mode will be delighted with some of the advanced features available.

PaperClip File Options

Sequential File Format	**Commodore**
Disk Drive Arrangement	One Dual
Disk Drive Device Number	8
Dictionary Device Number	8
Printer Output	Device 4
RS232 Baud Rate	300
RS232 Word Length	8
RS232 Parity	NONE
RS232 Handshaking Standard	3-line
Printer File	fx80-a-alf
Character Set	french 64c

As a little bonus on the side, *PaperClip II* provides a thoroughly implemented Telecommunications module in the program. Bulletin boards, databases and other computers can be accessed from within PaperClip, simply by pressing the "NO SCROLL" key and moving into Communications mode. A large buffer can be used either to prepare outgoing electronic mail, or to capture incoming data.

Verdict: I have become very attached to *PaperClip.* However, it's not a particularly easy wordprocessor to master.

The Spelling Checker and Telecommunication modules are both excellent, and extremely useful - a real bonus.

If you are looking for an advanced professional wordprocessing package, with every option you could ever require, *PaperClip II* may be just what you need. On the Campbell Scale of Wordprocessing excellence, *PaperClip II* rates 83% - highly commended. Now excuse me while I hook up the modem - I've got a deadline to meet.

Distributed by ECP. R.R.P. for both the C64 and C128 is $99.

Pocket Writer

If you are looking for a capable and affordable wordprocessing package, *Pocket Writer* should be at the top of your list.

The selling price of *Pocket Writer* is worthy of comment. My copy of the program was imported from the United States. I ordered it from an American software discounter, selling at well below the American recommended retail price of US$59. The well known plight of our Australian dollar hit hard at this point, with a Mastercard bill of somewhere around $100. Mind you, I still thought it was a bargain at this price.

Imagineering are taking the unprecedented step of selling *Pocket Writer* for $80.

Pocket Writer arrives in a neat and strong plastic case, together with a small but comprehensive manual. The aim of the programmers was to make the manual redundant with a comprehensive HELP system on screen.

Seven lines at the top of the screen are allocated to status and 'Help' information. In EDIT mode, the information area displays the functions available if the "C=" key is pressed, gives a reminder that text formatting options are accessed by the "ESC" key, and suggests pressing the "HELP" key for more detailed help.

Text formatting, such as justification, margin setting and spacing are all selected from a menu accessed through the ESC key.

Underlining, bold face, italics, superscripts and subscripts are all selected by a CONTROL key combination: for example, boldface is selected by pressing CONTROL B, with the cursor at the beginning of the text to be emphasised.

It is in this area that *Pocket Writer* excels, for the program offers genuine WOTSIWHTP. Yep, you guessed it - What's On The Screen Is What Hits The Paper. In other more mundane circles, this is called WYSIWYG.

Like most wordprocessors for the 128, *Pocket Writer* allows text memory to be split so that two documents can be in memory at once.

Another useful feature is the ability to read and write Sequential and Program files. It is possible to load files from *PaperClip*, *WordPro*, and *EasyScript* (and probably *Bank Street Writer*), a feature that I have found quite convenient.

Another nice feature is the ability to alphabetically sort a list by highlighting the area to be sorted and pressing "CTRL S".

All the usual search and replace functions are available - in fact, I cannot think of any area in which *Pocket Writer* is lacking. In terms of price and performance, presentation and ease of use, I give *Pocket Writer* my unreserved commendation.

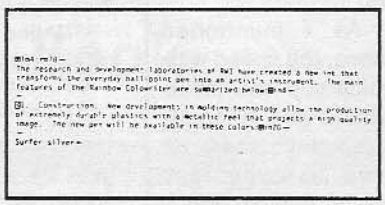
Distributed by Imagineering, (02) 697 8666 RRP $79.00 for the C64 and $88 for the C128.

Superscript

Superscript is not just a mere update of *Easyscript*, although it does come from the same stable. It is a word processor geared to all levels of users, although I suspect that those who are just discovering the world of word processing may find this a daunting program.

The *Superscript* manual is comprehensive and leads the user through logical tutorials which demonstrate the power and versatility of this package. Easy reference pages clearly provide all of the information needed to get the system up and running. One point, however, that I do miss, is a quick reference card like they supplied with *Easyscript*.

The big thing about *Superscript* is that it is a programmable word processor. That is, you can set up your work disks in such a way as to provide single key stroke commands for those features which you use most often. You can even program commonly used phrases, names, addresses etc. etc. so that it will bye typed up on the screen at a single key stroke, if you don't count the ESCAPE or RUN/STOP key which you hit first to access the command keys.



If the thought of programming daunts you *Superscript* can be operated from a menu line which is always hiding at the top of the screen. By hitting F1 the MENU appears and from that your selections can be made eithe. by using the cursor (slow) or by using abbreviated first letter commands (faster).

Superscript is loaded with other features that I didn't even know I was missing. Like the five function calculator which enables you to set up a broadsheet or it can be used independently of your current document (to perform calculations which young Freddy needs to check his homework while you are busy writing the Great Australian Novel!)..

Editing can be done in any width of your screen (40 or 80 columns) up to 240 columns.

All of the usual features you would expect with a good word processor are present in *Superscript*. There is a powerful SEARCH command which will hunt out any word or phrase either by exact match or by partial match and ignoring upper/lower case difference, forward or backward through your writing.

The spelling checker included with *Superscript* is accessed from the DOCUMENT menu and after *Easyspell* must be the best thing since sliced bread.

The PRINT menu allows you to view the document on screen exactly as it will appear in print.

Any professional writer, would-be author, university student, teacher, letter writer, businessman or even school pupil should have a tool like this at their disposal. It lives up to its name and is definitely a worthy successor to that great little workhorse *Easyscript*. It is a powerful word processor and even 64 owners will love its features. With the 128 I would place it above many word processors which sell for six times the price and that includes *Wordstar*.

Distributed by Commodore Australia. Price $99 for both the C64 and C128.

Basic Tips

If you ever type any sort of program into your computer, you will sooner or later get that terrible sinking feeling that comes when you make some damn fool mistake and the whole of your work goes down the gurgle. You can lose the result of several hours typing through some inadvertent POKE or SYS command. I make no claim to holding the world's record in losing typed-in programs, but I would certainly be up there with the top-ranking few.

Now, you and I can retrieve a program intact by simply loading and SYSing the following program. Having been told very severely by the publisher that there will be no "computer speak" in this Annual, let me explain what SYSing means.

You load the program using the command 'LOAD "Filename",1,1' if you are using a cassette and 'LOAD "Filename",8,1' if you are using a disk drive. Then type in the command SYS and then the start address of the relevant program which in this case happens to be 49152. Press Return.

Once you have entered the program and run it, use the BSAVE program, which appears elsewhere in this issue, to SAVE it as a machine code file. I suggest save the program under the name "OLD" as it is virtually the opposite to the "NEW" command.

In the event of your system "hanging up" or "crashing" there is one small job to carry out first.

Some of us are lucky enough to own a reset switch which will do the job just fine.

For the rest of the nation, reach for the nearest paper clip and bend it as you will see fit in just a moment.

Now stand up and lean over your computer so that you can see the back panel in the general vicinity of the USER port. (The one directly below the Commodore logo, next to the cassette port).

Still leaning over the machine but looking towards the front, starting at the right end of the port mentally number the first three pins from 1 to 3. Now the tricky bit. Using your trusty paper clip, short out pins one and three. In other words, connect pin 1 to pin 3 for about one second.

Simple stuff, no need to fret. Chances are highly remote that you could damage anything apart from your nerves.

If all else fails, drop around to your local computer store and have them either sell you a reset switch or demonstrate the many uses of a paper clip.

What you have actually done is grounded or earthed the RESET line. When this occurs for a certain period of time (shorter than you'd care to imagine) the 64 goes off and does the next best thing to a cold start.

Your can lose the result of several hours typing

Cold start?

That's what happens when you switch your computer on.

There is one major difference between forcing a reset and turning your computer off and on.

Using the first method, the contents of memory are not lost, only rearranged slightly. However, the pointers which tell the computer where our program starts and ends are gone and that's where the

```
ready

1 rem old . . basic loader
2 rem
3 rem by andrew farrell
4 rem
5 rem program sits at $c000 . . (49152)
6 rem
10 s=49152:
20 data 169, 1,141,2,8,32,51,165,24,165,34,105,2,133,45,165,35,105,0,133,47,96
30 reada:ifa=999then50
40 pokes,a:s=s+1:q=q+a:goto30
50 ifq<>1658thenprint"data error":stop
60 data 999

ready.
```

OLD program comes into the picture.

OLD restores these pointers and relinks the BASIC line numbers so that everything is back to how it was those few brief moments before all was lost.

Now to the final step:

LOAD "OLD",8,1.

Type in SYS 49152 and bingo!

Your program is now ready to continue editing.

If the same nasty gremlin should cause a similar catastrophe later on, there's no need to reload "OLD" as long as you have not erased any part of it.

You can also use OLD even if the program hasn't crashed. It is very useful if you have typed in NEW by accident. All you have to do is type in 'SYS 49152' and then Return and all is as it was before.

OLD sits in the memory at $C000, which is a nice vacant 4K area between the BASIC ROM and KERNAL ROM. Again, in our constant efforts to demystify the whole process, we'll look at exactly what that means. In exactly the same way that a Street Directory says "63 G7" to show you where a street is in a suburb, so the memory has a map and $C000 is a place on that map. For simplicity's sake let us say that in the Memory is installed a language, BASIC, and a series of instructions called the KERNAL. OLD is positioned between these in the same way as a computer shop is placed between the pub and the town hall.

I hope you lose less hair after typing in this program.

To save a byte or two

One of the smaller problems of owning a Commodore 64 is the lack of a built-in monitor.

What is a monitor?

Monitor is a word that can be used to mean a Visual Display Unit on which you view the results of your work, or someone else's if you are using a commercially produced program.

The monitor I am talking about is something altogether different. This monitor is actually a monitor of what goes on at the heart of your computer.

I'm talking about a machine code monitor.

This tool provides us with the ability to see what's where in memory as well as being able to modify things a little.

Hesware distributes a very nice monitor on cartridge which, for those of you interested, also has a one line Assembler. This program gives you the ability to SAVE any given block of memory, which is perhaps the most useful facility of this cartridge and others like it.

How, you ask, can I possibly use that?

For a start, you can save the OLD routine previously mentioned, as well being able to SAVE any other machine code program of which you know the start and end address.

Having typed in the program below and run it, you will see one of two things. The familiar READY sign will indicate all is well. If the words ENTRY ERROR appear, check your data statement and try again.

Then SAVE it, before you LOSE it. (Although the LOSE command is not part of Commodore BASIC, it is often used by programmers worldwide to cause much grinding of teeth and loss of skin.)

To use the BSAVE routine type in the following command:

SYS 52992, start address, end address, "filename", device (r)

What a mess. It almost looks like an instruction out of an *Easy Script* manual.

In human terms it means you must know the start address and end address as a decimal number (1,2,3,4 . . . 65536), the filename and the device to which you wish to SAVE. For disk the device is 8 and for cassette it is 1.

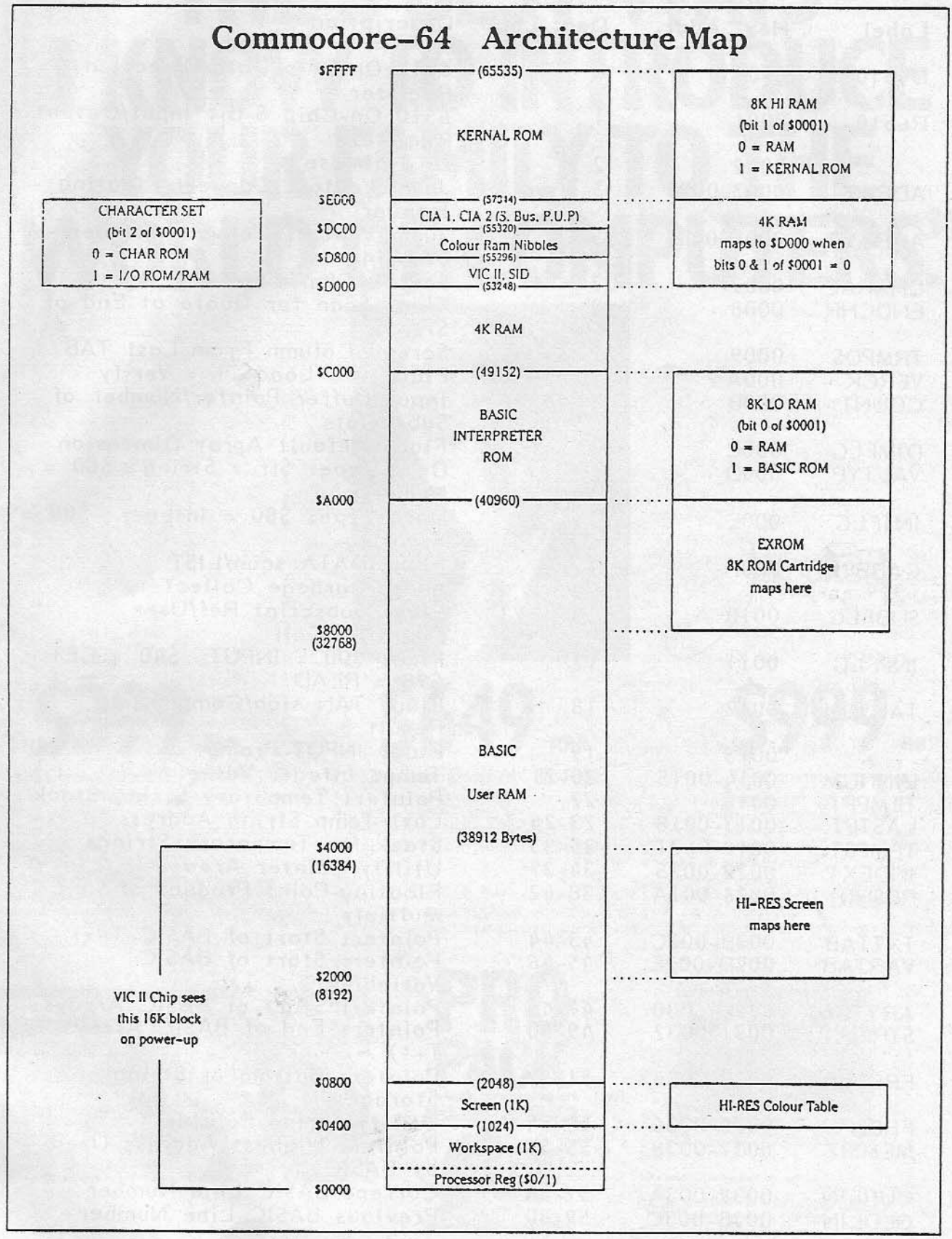
Disk users may also include DOS commands as part of the filename such as "0:FRED" to save the file FRED to drive 0.

BSAVE has a small drawback. You may not use a variable as the filename. For example you must not say SAVE N$. The filename must be a constant.

```
ready.

5000 rem block save routine
5005 rem
5006 rem by andrew farrell
5007 rem
5010 rem start 52992 - end 53066
5020 rem
5100 i=52992:
5110 reada:z=z+a:ifa=999then 5130
5120 pokei,a:i=i+1:goto 5110
5130 ifz<>9334thenprint"entry error"
5150 end
6000 data 165,43,133,87,165,44,133,88,165,45,133,89,165,46,133,90,32,253
6010 data 174,32,138,173,32,247,183,165,20,133,43,165,21,133,44,32,253
6020 data 174,32,138,173,32,247,183,234,165,20,133,45,165,21,133,46,32,25
6030 data 3,174,32,86,225,165,87,133,43,165,88,133,44,165,89,133,45,165
6040 data 90,133,46,96
6099 data 999

ready.
```

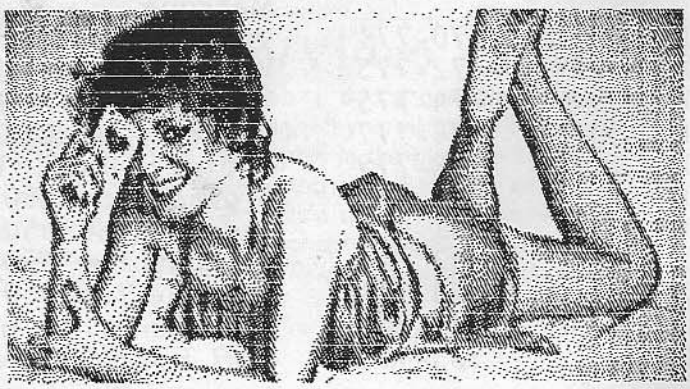

Commodore–64 Architecture Map
$FFFF
(65535)
KERNAL ROM
8K HI RAM
(bit 1 of $0001)
0 = RAM
1 = KERNAL ROM
$E000
(57344)
CIA 1, CIA 2 (S. Bus, P.U.P)
$DC00
(55320)
Colour Ram Nibbles
$D800
(55296)
VIC II, SID
$D000
(53248)
4K RAM
maps to $D000 when
bits 0 & 1 of $0001 = 0
CHARACTER SET
(bit 2 of $0001)
0 = CHAR ROM
1 = I/O ROM/RAM
4K RAM
$C000
(49152)
BASIC
INTERPRETER
ROM
8K LO RAM
(bit 0 of $0001)
0 = RAM
1 = BASIC ROM
$A000
(40960)
EXROM
8K ROM Cartridge
maps here
$8000
(32768)
BASIC
User RAM
(38912 Bytes)
$4000
(16384)
HI-RES Screen
maps here
$2000
(8192)
VIC II Chip sees
this 16K block
on power-up
$0800
(2048)
Screen (1K)
HI-RES Colour Table
$0400
(1024)
Workspace (1K)
Processor Reg ($0/1)
$0000

Commodore Operating System Memory Map

Label	Hex. Addr.	Dec. Loc.	Description
D6510	0000	0	6510 On-Chip Data-Direction Register
R6510	0001	1	6510 On-Chip 8-Bit Input/Output Register
	0002	2	Do Not Use
ADRAY1	0003-0004	3-4	Jump Vector: Convert Floating - Integer
ADRAY2	0005-0006	5-6	Jump Vector: Convert Integer - Floating
CHARAC	0007	7	Search Character
ENDCHR	0008	8	Flag: Scan for Quote at End of String
TRMPOS	0009	9	Screen Column From Last TAB
VERCK	000A	10	Flag: 0 = Load 1 = Verify
COUNT	000B	11	Input Buffer Pointer/Number of Subscripts
DIMFLG	000C	12	Flag: Default Array Dimension
VALTYP	000D	13	Data Type: $ff = String $00 = Numeric
INTFLG	000E	14	Data Type: $80 = Integer $00 = Floating
GARBFL	000F	15	Flag: DATA scan/LIST quote/Garbage Collect
SUBFLG	0010	16	Flag: Subscript Ref/User Function Call
INPFLG	0011	17	Flag: $00 = INPUT $40 = GET $98 = READ
TANSGN	0012	18	Flag: TAN sign/Comparison Result
	0013	19	Flag: INPUT Prompt
LINNUM	0014-0015	20-21	Temp: Integer Value
TEMPPT	0016	22	Pointer: Temporary String Stack
LASTPT	0017-0018	23-24	Last Temp String Address
TEMPST	0019-0021	25-33	Stack for Temporary Strings
INDEX	0022-0025	34-37	Utility Pointer Area
RESHO	0026-002A	38-42	Floating-Point Product of Multiply
TXTTAB	002B-002C	43-44	Pointer: Start of BASIC Text
VARTAB	002D-002E	45-46	Pointer: Start of BASIC Variables
ARYTAB	002F-0030	47-48	Pointer: Start of BASIC Arrays
STREND	0031-0032	49-50	Pointer: End of BASIC Arrays (+1)
FRETOP	0033-0034	51-52	Pointer: Bottom of String Storage
FRESPC	0035-0036	53-54	Utility String Pointer
MEMSIZ	0037-0038	55-56	Pointer: Highest Address Used by BASIC
CURLIN	0039-003A	57-58	Current BASIC Line Number
OLDLIN	003B-003C	59-60	Previous BASIC Line Number

Label	Hex. Addr.	Decimal Loc.	Description
OLDTXT	003D-003E	61-62	Pointer: BASIC Statement for CONT
DATLIN	003F-0040	63-64	Current DATA Line Number
DATPTR	0041-0042	65-66	Pointer: Current DATA Item Address
INPPTR	0043-0044	67-68	Vector: INPUT Routine
VARNAM	0045-0046	69-70	Current BASIC Variable Name
VARPNT	0047-0048	71-72	Pointer: Current BASIC Variable Data
FORPNT	0049-004A	73-74	Pointer: Index Variable for FOR/NEXT
	004B-0060	75-96	Temp Pointer/Data Area
FACEXP	0061	97	Floating-Point Accumulator #1: Exponent
FACHO	0062-0065	98-101	Floating Accum. #1: Mantissa
FACSGN	0066	102	Floating Accum. #1: Sign
SGNFLG	0067	103	Pointer: Series Evaluation Constant
BITS	0068	104	Floating Accum. #1: Overflow Digit
ARGEXP	0069	105	Floating-Point Accumulator #2: Exponent
ARGHO	006A-006D	106-109	Floating Accum. #2: Mantissa
ARGSGN	006E	110	Floating Accum. #2: Sign
ARISGN	006F	111	Sign Comparison Result: Accum. #1 vs #2
FACOV	0070	112	Floating Accum. #1. Low-Order (Rounding)
RODBS	029D	669	RS-232 Start of Output Buffer (Page)
RODBE	029E	670	RS-232 Index to End of Output Buffer
IRQTMP	029F-02A0	671-672	Holds IRQ Vector During Tape I/O
ENABL	02A1	673	RS-232 Current Enabled Interrupts
	02A2-02FF	674-677	Cassette Temp Data Area
	02A6	678	Flag: 0 = NTSC Video 1 = PAL Video
	02A7-02FF	679-767	Not Used
IERROR	0300-0301	768-769	Vector: Print BASIC Error Message
IMAIN	0302-0303	770-771	Vector: BASIC Warm Start
ICRNCH	0304-0305	772-773	Vector: Tokenize BASIC Text
IQPLOP	0306-0307	774-775	Vector: BASIC Text LIST
IGONE	0308-0309	776-777	Vector: BASIC Char Dispatch
IEVAL	030A-030B	778-779	Vector: BASIC Token Evaluation
SAREG	030C	780	Storage for 6502 .A Register
SXREG	030D	781	Storage for 6502 .X Register
SYREG	030E	782	Storage for 6502 .Y Register.
SPREG	030F	783	Storage for 6502 .SP Register
USRPOK	0310-0313	784-787	USR Function Jump Instr ($4c)
USRADD	0314-0315	785-786	USR Function Jump Address

Label	Hex. Addr.	Decimal Loc.	Description
CINV	0314-0315	788-789	Vector: Hardware IRQ Interrupt
CBINV	0316-0317	790-791	Vector: BRK Instr. Interrupt
NMINV	0318-0319	792-793	Vector: Non-Maskable Interrupt
IOPEN	031A-031B	794-795	Open a Logical File
ICLOSE	031C-031D	796-797	Close a Specified Logical File
ICHKIN	031E-031F	798-799	Kernal CHKIN Routine Vector
ICKOUT	0320-0321	800-801	Open Channel for Output
ICLRCH	0322-0323	802-803	Close Input and Output Channels
IBASIN	0324-0325	804-805	Kernal CHRIN Routine Vector
IBSOUT	0326-0327	806-807	Kernal CHROUT Routine Vector
ISTOP	0328-0329	808-809	Scan Stop Key
IGETIN	032A-032B	810-811	Get Character from Keyboard Queue (Keyboard Buffer)
ICLALL	032C-032D	812-813	Close a Specified Logical File
USRCMD	032E-032F	814-815	User-Defined Vector
ILOAD	0330-0331	816-817	Load RAM from a Device
ISAVE	0332-0333	818-819	Save RAM to a Device
TBUFFR	033C-03FB	828-1019	Tape I/O Buffer
VICSCN	0400-07FF	1024-2047	1024 Byte Screen Memory Area
	0400-07E7	1024-2023	Video Matrix: 25 Lines x 40 Columns
	07F8-07FF	2040-2047	Sprite Data Pointers
	0800-9FFF	2048-40959	Normal BASIC Program Space
	8000-9FFF	32768-40959	Optional Cartridge ROM - 8192 Bytes
	A000-BFFF	40960-49151	BASIC ROM - 8192 Bytes (or 8K RAM)
	C000-CFFF	49152-53247	RAM - 4096 Bytes
	D000-DFFF	53248-57343	Input/Output Devices and Color RAM or Character Generator ROM or RAM - 4096 Bytes
	E000-FFFF	57344-65535	Kernal ROM - 8192 Bytes (or 8K RAM)



Commodore Input/Output Register Map

Hex.	Decimal	Bits	Description
0000	0	0-7	MOS 6510 Data Direction Register (xx101111) Bit=1: Output Bit=0: Input x=Don't Care
0001	1		MOS 6510 Micro-Processor On-Chip I/O Port
		0	/LORAM Signal (0=Switch BASIC ROM Out)
		1	/HIRAM Signal (0=Switch Kernal ROM Out)
		2	/CHAREN Signal (0=Switch Char. ROM In)
		3	Cassette Data Output Line
		4	Cassette Switch Sense 1 = Switch Closed
		5	Cassette Motor Control 1 = OFF 0 = ON
		6-7	Undefined
d000-d02e	**53248-54271**		**MOS 6567 Video Interface Controller (VIC)**
d000	53248		Sprite 0 X Pos
d001	53249		Sprite 0 Y Pos
d002	53250		Sprite 1 X Pos
d003	53251		Sprite 1 Y Pos
d004	53252		Sprite 2 X Pos
d005	53253		Sprite 2 Y Pos
d006	53254		Sprite 3 X Pos
d007	53255		Sprite 3 Y Pos
d008	53256		Sprite 4 X Pos
d009	53257		Sprite 4 Y Pos
d00a	53258		Sprite 5 X Pos
d00b	53259		Sprite 5 Y Pos
d00c	53260		Sprite 6 X Pos
d00d	53261		Sprite 6 Y Pos
d00e	53262		Sprite 7 X Pos
d00f	53263		Sprite 7 Y Pos
d010	53264		Sprites 0-7 X Pos (msb of X coord.)
d011	53265		VIC Control Register
		7	Raster Compare: (Bit 8) See 53266
		6	Extended Color Text Mode: 1 = Enable
		5	Bit-Map Mode: 1 = Enable
		4	Blank Screen to Border Color: 0 = Blank
		3	Select 24/25 Row Text Display: 1 = 25 Rows
		2-0	Smooth Scroll to Y Dot-Position (0-7)
d012	53266		Read Raster / Write Raster Value for Compare IRQ
d013	53267		Light-Pen Latch X Pos
d014	53268		Light-Pen Latch Y Pos
d015	53269		Sprite Display Enable: 1 = Enable
d016	53270		VIC Control Register
		7-6	Unused
		5	Reset VIC Chip: 1 = Reset 0 = Normal

Hex.	Decimal	Bits	Description
		4	Multi-Color Mode: 1 = Enable (Text or Bit-Map)
		3	Select 38/40 Column Text Display: 1 = 40 Cols
		2-0	Smooth Scroll to X Pos (0-7)
d017	53271		Sprites 0-7 Expand 2x Vertical (Y): 1 = Expand
d018	53272		VIC Memory Control Register
		7-4	Video Matrix (Screen) Base Address (in VIC space)
		3-1	Character Dot-Data Base Address (in VIC space)
d019	53273		VIC Interrupt Flag Register (Bit = 1: IRQ Occurred)
		7	Set on Any Enabled VIC IRQ Condition
		3	Light-Pen Triggered IRQ Flag
		2	Sprite vs Sprite Collision IRQ Flag
		1	Sprite vs Background Collision IRQ Flag
		0	Raster Compare IRQ Flag
d01a	53274		IRQ Mask Register: 1 = IRQ Enabled
d01b	53275		Sprite vs Background Display Priority: 1 = Sprite
d01c	53276		Sprites 0-7 Multi-Color Mode Select: 1 = M.C.M.
d01d	53277		Sprites 0-7 Expand 2x Horizontal (X): 1 = Expand
d01e	53278		Sprite vs Sprite Collision Detect
d01f	53279		Sprite vs Background Collision Detect
d020	53280		Border Color
d021	53281		Background Color 0
d022	53282		Background Color 1
d023	53283		Background Color 2
d024	53284		Background Color 3
d025	53285		Sprite Multi-Color Register 0
d026	53286		Sprite Multi-Color Register 1
d027	53287		Sprite 0 Color
d028	53288		Sprite 1 Color
d029	53289		Sprite 2 Color
d02a	53290		Sprite 3 Color
d02b	53291		Sprite 4 Color
d02c	53292		Sprite 5 Color
d02d	53293		Sprite 6 Color
d02e	53294		Sprite 7 Color
d400-d7ff	**54272-55295**		**MOS 6581 Sound Interface Device (SID)**
d400	54272		Voice 1: Frequency Control, Low-Byte
d401	54273		Voice 1: Frequency Control, High-Byte
d402	54274		Voice 1: Pulse Waveform Width, Low-Byte
d403	54275	7-4	Unused
		3-0	Voice 1: Pulse Waveform Width, High-Nybble

Hex.	Decimal	Bits	Description
d404	54276		Voice 1: Control Register
		7	Select Random Noise Waveform 1 = On
		6	Select Pulse Waveform 1 = On
		5	Select Sawtooth Waveform 1 = On
		4	Select Triangle Waveform 1 = On
		3	Test Bit: 1 = Disable Oscillator 1
		2	Ring Modulate Osc. 1 with Osc. 3 Output 1 = On
		1	Synchronize Osc. 1 with Osc. 3 Frequency 1 = On
		0	Gate Bit: 1 = Start Att/Dec/Sus 0 = Start Release
d405	54277		Envelope Generator 1: Attack/Decay Cycle Control
		7-4	Select Attack Cycle Duration: 0-15
		3-0	Select Decay Cycle Duration: 0-15
d406	54278		Envelope Generator 1: Sustain/Release Cycle Control
		7-4	Select Sustain Cycle Amplitude Level: 0-15
		3-0	Select Release Cycle Duration: 0-15
d407	54279		Voice 2: Frequency Control, Low-Byte
d408	54280		Voice 2: Frequency Control, High-Byte
d409	54281		Voice 2: Pulse Waveform Width, Low-Byte
d40a	**54282**	**7-4**	**Unused**
		3-0	Voice 2: Pulse Waveform Width, High-Nybble
d40b	54283		Voice 2: Control Register
		7	Select Random Noise Waveform 1 = On
		6	Select Pulse Waveform 1 = On
		5	Select Sawtooth Waveform 1 = On
		4	Select Triangle Waveform 1 = On
		3	Test Bit: 1 = Disable Oscillator 2
		2	Ring Modulate Osc. 2 with Osc. 1 Output 1 = On
		1	Synchronize Osc. 2 with Osc. 1 Frequency 1 = On
		0	Gate Bit: 1 = Start Att/Dec/Sus 0 = Start Release
d40c	54284		Envelope Generator 2: Attack/Decay Cycle Control
		7-4	Select Attack Cycle Duration: 0-15
		3-0	Select Decay Cycle Duration: 0-15
d40d	54285		Envelope Generator 2: Sustain/Release Cycle Control
		7-4	Select Sustain Cycle Amplitude Level: 0-15
		3-0	Select Release Cycle Duration: 0-15
d40e	54286		Voice 3: Frequency Control, Low-Byte
d40f	54287		Voice 3: Frequency Control, High-Byte
d410	54288		Voice 3: Pulse Waveform Width, Low-Byte

Hex.	Decimal	Bits	Description
d411	54289	7-4	Unused
		3-0	Voice 3: Pulse Waveform Width, High-Nybble
d412	54290		Voice 3: Control Register
		7	Select Random Noise Waveform 1 = On
		6	Select Pulse Waveform 1 = On
		5	Select Sawtooth Waveform 1 = On
		4	Select Triangle Waveform 1 = On
		3	Test Bit: 1 = Disable Oscillator 3
		2	Ring Modulate Osc. 3 with Osc. 2 Output 1 = On
		1	Synchronize Osc. 3 with Osc. 2 Frequency 1 = On
		0	Gate Bit: 1 = Start Att/Dec/Sus 0 = Start Release
d413	54291		Envelope Generator 3: Attack/Decay Cycle Control
		7-4	Select Attack Cycle Duration: 0-15
		3-0	Select Decay Cycle Duration: 0-15
d414	54292		Envelope Generator 3: Sustain/Release Cycle Control
		7-4	Select Sustain Cycle Amplitude Level: 0-15
		3-0	Select Release Cycle Duration: 0-15
d415	54293		Filter Cutoff Frequency: Low-Nybble (Bits 2-0)
d416	54294		Filter Cutoff Frequency: High-Byte
d417	54295		Filter Resonance Control/Voice Input Control
		7-4	Select Filter Resonance: Min = 0 Max = 15
		3	Filter External Input: 1 = Yes 0 = No
		2	Filter Voice 3 Output: 1 = Yes 0 = No
		1	Filter Voice 2 Output: 1 = Yes 0 = No
		0	Filter Voice 1 Output: 1 = Yes 0 = No
d418	54296		Select Filter Mode and Volume
		7	Cut-Off Voice 3 Output: 1 = Off 0 = On
		6	Select Filter High-Pass Mode: 1 = On
		5	Select Filter Band-Pass Mode: 1 = On
		4	Select Filter Low-Pass Mode: 1 = On
		3-0	Select Output Volume: OFF = 0 Max = 15
d419	**54297**		**Analog/Digital Converter: Game Paddle 1 (0-255)**
d41A	54298		Analog/Digital Converter: Game Paddle 2 (0-255)
d41B	54299		Oscillator 3 Random Number Generator
d41C	54300		Envelope Generator 3 Output
d500-d7ff	**54528-55295**		**SID Register Images**
d800-dbff	**55296-56319**		**Color Cntrl RAM (Only Bits 3-0 Present)**

Hex.	Decimal	Bits	Description
dc00-dcff	**56320-56335**		**MOS 6526 Complex Interface Adapter (CIA) #1**
dc00	56320		Data Port A (Keyboard Joystick Paddles): Game Port 2
		7-0	Write Keyboard Column Values for Keyboard Scan
		7-6	Select Paddle Input Port: 01 = Port 1 10 = Port 2
		4	Joystick-2 Fire Button: 0 = Fire
		3-2	Paddle Fire Buttons: 0=Fire
		3-0	Joystick-2 Direction: Bit=1 Open Sw, Bit=0 Closed
dc01	56321		Data Port B (Keyboard Joystick Paddles Lightpen)
		7-0	Read Keyboard Row Values for Kybrd Scan
		4	Joystick-1 Fire Button / Lightpen Trigger (0 = Fire)
		3-2	Paddle Fire Buttons: 0=Fire
		3-0	Joystick-1 Direction: Bit=1 Open Sw, Bit=0 Closed
dc02	56322		Data Direction Register -Port A (56320)
dc03	56323		Data Direction Register -Port B (56321)
dc04	56324		Timer A: Low-Byte
dc05	56325		Timer A: High-Byte
dc06	56326		Timer B: Low-Byte
dc07	56327		Timer B: High-Byte
dc08	56328		Time-of-Day Clock: 1/10 Seconds
dc09	56329		Time-of-Day Clock: Seconds
dc0a	56330		Time-of-Day Clock: Minutes
dc0b	56331		Time-of-Day Clock: Hours + AM/PM Flag (Bit 7)
dc0c	56332		Synchronous Serial I/O Data Buffer
dc0d	56333		CIA Interrupt Control Reg. (Read Flags/Write Mask)
		7	IRQ Flag (1 = IRQ Occurred)/Mask Set Minus Clear Flag
		4	FLAG1 IRQ (Cassette Read/Serial IEEE SRQ Input)
		3	Serial Port Interrupt
		2	Time-of-Day Alarm Interrupt
		1	Timer B Underflow Interrupt
		0	Timer A Underflow Interrupt
dc0e	56334		CIA Control Register A
		7	Time-of-Day Clock Frequency: 1=50 Hz 0=60 Hz
		6	Serial Port Mode: 1=Output 0=Input
		5	Timer A Counts: 1=CNT Signals 0=System 02 Clock
		4	Force-Load Timer A: 1=Yes
		3	Timer A Run Mode: 1=Once 0=Continous

Hex.	Decimal	Bits	Description
		2	Timer A Output Mode to PB6: 1=Toggle 0=Pulse
		1	Timer A Output to PB6: 1=Yes 0=No
		0	Start/Stop Timer A: 1=Start 0=Stop
dc0f	56335		CIA Control Register B
		7	Set TOD Alarm/Clock: 1=Alarm 0=Clock
		6-5	Timer B - Mode Select: 00 = Count System 02 Clock Pulses 01 = Count Positive CNT Transitions 10 = Count Timer A Underflow Pulses 11 = Count Timer A Underflows While CNT Positive
		4-0	Same as Control Register A: for Timer B
dd00-ddff	**56576-56591**		**MOS 6526 Complex Interface Adapter (CIA) #2**
dd00	56576		Data Port A (Serial IEEE, RS-232, VIC Memory Ctl)
		7	Serial IEEE Data Input
		6	Serial IEEE Clock Pulse Input
		5	Serial IEEE Data Output
		4	Serial IEEE Clock Pulse Output
		3	Serial IEEE ATN Signal Output
		2	RS-232 Data Output (User Port)
		1-0	VIC Chip System Memory Bank Select (Default = 11)
dd01	56577		Data Port B (User Port/RS-232 Signals)
		7	User / RS-232 Data Set Ready
		6	User / RS-232 Clear to Send
		5	User - Undefined
		4	User / RS-232 Carrier Detect
		3	User / RS-232 Ring Indicator
		2	User / RS-232 Data Terminal Ready
		1	User / RS-232 Request to Send
		0	User / RS-232 Received Data
		/FLAG	User / RS-232 Receive: Detect Start-Bit (IRQ Flag)
dd02	56578		Data Direction Register - Port A
dd03	56579		Data Direction Register - Port B
dd04	56580		Timer A: Low-Byte
dd05	56581		Timer A: High-Byte
dd06	56582		Timer B: Low-Byte
dd07	56583		Timer B: High-Byte
dd08	56584		Time-of-Day Clock: 1/10 Seconds
dd09	56585		Time-of-Day Clock: Seconds
dd0a	56586		Time-of-Day Clock: Minutes
dd0b	56587		Time-of-Day Clock: Hours + AM/PM Flag (Bit 7)
dd0c	56588		Synchronous Serial I/O Data Buffer
dd0d	56589		CIA Interrupt Control Reg. (Read Flags/Write Mask)

Hex.	Decimal	Bits	Description
		7	NMI Flag (1 = NMI Occurred)/Mask Set-Clear Flag
		4	FLAG2 NMI: Detects Start-Bit on Recv
		3	Synchronous Serial Port Interrupt
		2	Time-of-Day Alarm Interrupt
		1	Timer B Interrupt
		0	Timer A Interrupt
dc0e	56590		CIA Control Register A (Same Format as 56334)
dc0f	56591		CIA Control Register B (Same Format as 56335)
de00-deff	56832-57087		Reserved for Future I/O Expansion
df00-dfff	57088-57343		Reserved for Future I/O Expansion

Pokes for your C64

Many special memory locations inside your C64 control aspects of how the computer works. Here's a giant list of some of the more commonly used POKE's. Most have no other side-effects, but a few do cause a few other minor upsets, so take care. A POKE command tells BASIC to put a specific value into a memory locations. That value must be between zero and 255, since the Commodore 64 is an eight bit computer.

POKE	EFFECT
19,65	INPUTs without displaying question mark.
19,0	Restores the question mark
22,35	Lists without line numbers (Syntax error restores them)
120,0	Mindless printing machine
198,0	Clears keyboard buffer
199,1	Prints in RVS mode
199,0	Turns RVS off
211,X	Cursor to row X
214,Y:PRINT	Cursor to column Y
212,0	Disables Quote mode
646,X	Changes cursor color (X=0 to 15)
649,0	Disables keyboard
649,10	Enables keyboard
650,0	Normal repeat
650,64	No keys repeat
650,128	All keys repeat
657,1	Disables shift/Commodore keys
657,0	Enables shift/Commodore keys
774,0	Lists only line numbers
774,26	Resets the above
774,131:775,164	Disables list
774,226:775,252	List gives cold start
775,168	Disables List
775,191	Disables List
775,200	Disables List
775,167	Enables List
788,52:808,239	Disables Stop
788,49:808,237	Enables Stop
792,193	Disables Restore
792,71	Enables Restore
793,203	Disables Restore
808,127	Disables Run
808,234	Disables Stop/Restore/List
808,225	Disables Stop/Restore
808,239	Disables Stop (Stop/Restore ok)
816,157	Disables Load
816,165	Enables Load
818,131:819,164	Disables Save
818,226:819,252	Save gives cold start
818,32	Disables Save
818,237	Enables Save
819,246	Disables Save
819,245	Enables Save
819,245:818,32	Disables Save
819,245:818,237	Enables Save
53265,11	Turns off screen (Computer runs faster),
53265,27	Turns on screen (Alternative is Stop/Restore)
53272,21	Switches to Graphics mode
53272,23	Switches to Text mode
53280,X	Border color (X = 0 to 15)
53281,X	Screen Color (X = 0 to 15)
56325,X	Changes cursor speed (0 = fast, 58 = normal, 255 = slow)

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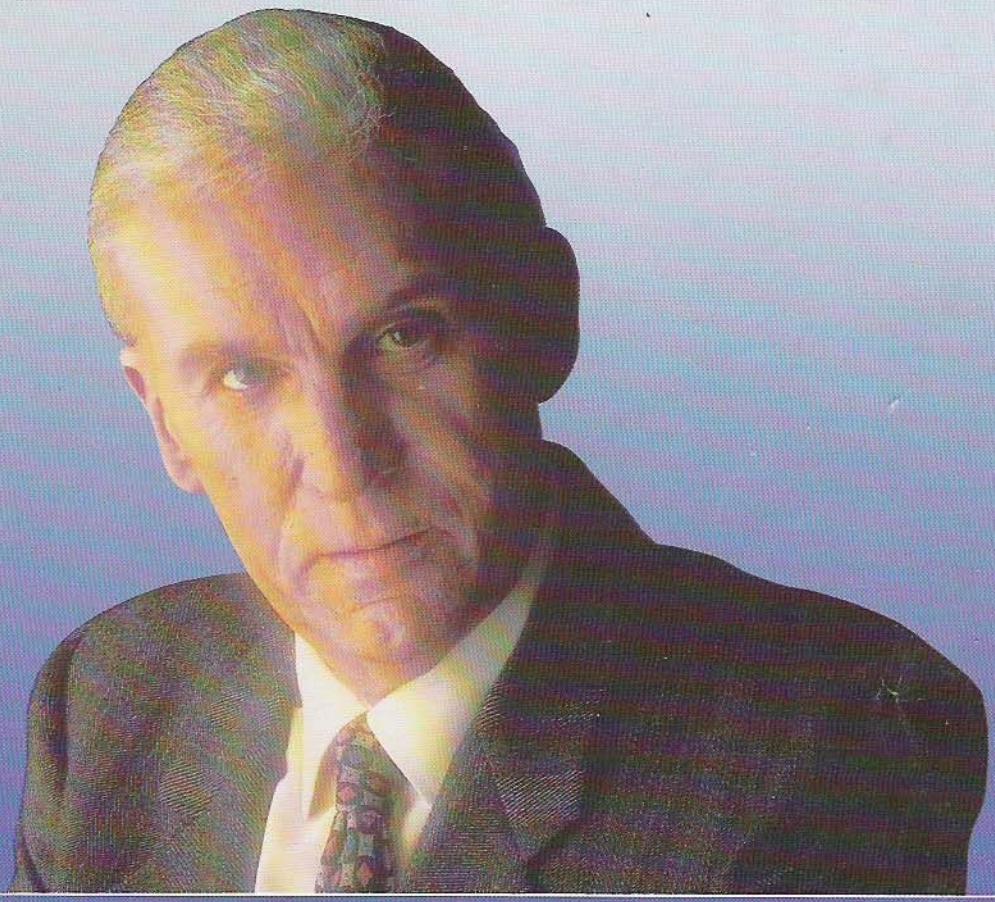

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